

STRIKE GOLD

with the most sophisticated TRS-80 operating system available!



DOS can't really turn your TRS-80 gold, but you'll think you've made the DOS strike of the decade when you turn your micro on to LDOS. You'll find a bonanza of features like full keyboard type-ahead; a true background spooler; file backup by date, class, and between different drive types; hard disk support; data transportability between Model I and III; and a complete communications utility including disk file send and receive. Support for Radio Shack's Doubler and selected others is also provided. With our Job Control Language, you get true "hands off" running of your application programs - give a single command and then walk away. The 400 page manual includes examples of all commands and utilities. The Operator's Guide gives you step by step instructions on how to use LDOS with your applications. Stop running with only "half" a computer! Let LDOS provide the missing features to speed up and simplify your TRS-80 computer system! Visit a dealer or contact LSI for more information on the most popular sophisticated operating system for your TRS-80.

LDOS is available worldwide through thousands of dealers | OGICAL for just \$129.

TRS-80 is a trademark of Tandy Corporation. LDOS is available for the TRS-80 Model-I and Model-III. Prices and specifications subject to change without notice. LDOS is a product of Logical Systems, Inc.

Logical Systems, Inc., 11520 N. Port Washington Rd., Mequon, Wis. 53092 (414) 241-3066

SYSTEMS INC.

M More and more hardware and communications services are allowing speeds up to 1200 baud. Soon, some may be going faster than that. Today's terminal software simply can't keep up. But now there is an alternative. Micro-Systems Software introduces MicroTerm, the high speed terminal. Model III MicroTerm will communicate, without insertion of null characters, at 4800 baud. Guaranteed. No cop-outs, no question. MicroTerm is so fast that you can exit from the terminal to the main menu, adjust video width, open the buffer, turn on the printer, or any one of dozens of other functions, and return to the terminal mode without missing a thing! MicroTerm continues to input from the RS232, even while at the main menu. This is the only terminal capable of such an astounding feat. MicroTerm offers you most of the features that "Brand X" smart terminals have, plus it gives you: • Ultra high baud rate operation (up to 9600 in certain cases). ● Input while at menu. ● Easy to use translation tables. ● Easy to use phone number listings. • Maximum auto dial support — most major brands. • Direct file transfer companion program included at no exta cost (compatible with DFT). • DOS commands from menu without exiting program. • Over 34K of capture buffer (in a 48K TRS-80). • Can be set to automatically dial telephone and transmit buffer at preset time without any operator intervention. And many, many more great features, MicroTerm is so fast you must see it to believe it. The various menus are displayed so fast, they seem to jump out at you. Status of various functions can be displayed and altered in split seconds. For the computerist who wants the ultimate, state-of-the-art terminal software, there is no other choice. MicroTerm retails for \$79.95, but registered DOSPLUS owners can purchase it for only \$59.95. \$20.00 off the retail price! MicroTerm comes complete with the terminal program, the direct file transfer program, some standard translation tables, and documentation. Don't delay, order yours today! Specify when ordering: Model I or III and whether you want it on 40 or 80 track media. Requires a 16K TRS-80 with one disk drive. We recommend 48K for serious communications work. MicroTerm will be available beginning June 30, 1982. Delivery to the same A LANGE OF STREET THE REAL PROPERTY. 11120711111 THE RESTRICTION OF THE PARTY OF THE REST OF THE REAL PROPERTY. MICRO-SYSTEMS SOFTWARE, INC. 4301-18 Oak Circle Boca Raton, FL 33431 Telephone: (305) 983-3390 800-327-8724 # 2



We're Expanding Your TRS-80* Model III With Reliable Hard-Line Thinking

Let's cut through all the "compu-babble" about hard-disk systems with some hard-line thinking.

You want a hard-disk system for your TRS-80* Model III for some fairly basic reasons:

- More storage capacity than your present system
- Faster retrieval and storage of information
- Accurate processing with reliable hardware and software

PERCOM DATA was pioneering critical, reliable data separation functions for micro systems long before many of today's companies even began. PERCOM DATA's solid industry reputation is your promise of hard-disk performance, from a drive with specifications equal to or superior to your own system.

PERCOM DATA 5¼ inch PHD's™ are your easy, hard-line answer. These units are available in 5, 10, 15 and 30 megabyte models. The First Drive unit has a micro-processor-based drive controller, permitting you to add up to 3 more hard-disk PHD's. And PHD series prices begin at under \$2500.

So, if you're ready to expand your TRS-80 Model III, do it with PERCOM DATA's PHD. Our hard-line thinking of more than half a decade means you get a reliable, high-quality PERCOM DATA peripheral, backed by the PERCOM DATA Performance Promise.

Take a hard-line of your own today! Call one of our Sales Consultants for more information and specifications or for the name of your close-by PERCOM DATA Dealer.

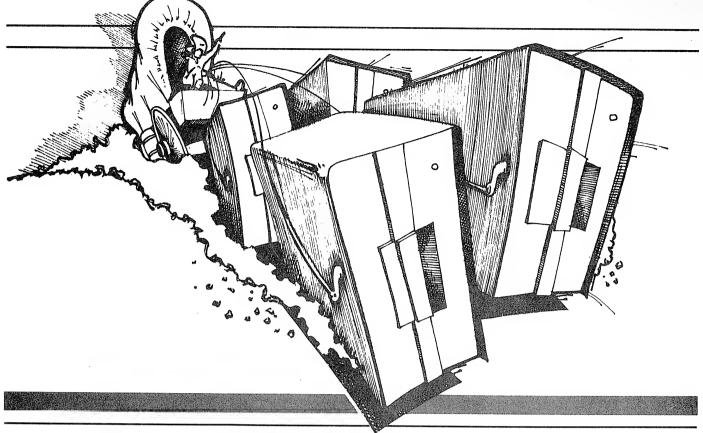
PERCOM DATA's Hard-Line Hotline is 1-800-527-1222



Expanding Your Peripheral Vision

DRIVES . NETWORKS . SOFTWARE

11220 Pagemill Road Dallas, Texas 75243 (214) 340-7081 1-800-527-1222



Machine, Language Disk I/O & Other Mysteries, To Harness The Power of Disk Drives.

The best and most complete book on TRS-80 Model I and Model III disk I/O available.

"Machine-Language Disk I/O & other mysteries" by Michael Wagner. Volume 5 of the popular "... and other mysteries" series published by IJG.

More than 190 pages of information and discoveries on the subject of disk I/O for the beginner and expert alike, using Z-80 Assembly Language to directly control the TRS-80 Model I and Model III disk drives and interrupt systems. With this book anyone can become a disk I/O "expert", and make more efficient use of disk space, or to write his or her own "full blown" disk operating system!

For the beginner and old pro'.

Machine-Language Disk I/O & Other Mysteries is packed with source code and flow chart illustrations for every function and operation described. And the source code for two complete disk I/O driver routines, one for the Model I and one for the Model III, are also included for "instant" access to your floppy drive systems.

Plus, the source code for a small disk operation system (S/OS) is included as a bonus. This S/OS contains all of the routines described in the book and shows how all of the disk I/O and interrupt functions should be incorporated into a working system.

On machine language disk I/O.

Machine-Language Disk I/O & Other Mysteries explains what the floppy drive system is all about, what Tracks and Sector are, the Western Digital Floppy Disk Controller 1771 and 1793 chips, read/write access, reading a selected drives' status, how to test and make sure a disk is in a drive or if a drive is on the system (on-line), the Head Restore command, the Head Step and Seek commands, the "Force-Interrupt of function" command, the Read Address command, the Read Track command, the Write Track (FORMAT) command, the Read Sector command, the Write



Sector command, Post Non-Maskable-Interrupt Processing for the model III, and much more.

On TRSDOS file I/O

and most TRSDOS-like operating systems, Machine-Language Disk I/O & Other Mysteries explains; what a disk file really is, what records are and how they're stored on the disk, creating a file, performing Direct Record I/O, performing Single Byte I/O, closing & killing files; error processing and TRSDOS error codes with their meanings, and much

Plus many-other handy programs, routines, and revelations are included. Such as a TRSDOS error message displayer, a disk formatter program, a program to calculate a password for a given encode, a object file load-format displayer, a file oriented full screen file editor, and a FULL BLOWN smart terminal program.

Machine-Language Disk I/O & Other Mysteries is a must for all programmers at just \$29.95. Available at computer stores, selected B. Dalton Booksellers and independent book dealers. If your dealer is out of stock, order direct. Include \$4.00 for shipping and handling. Foreign residents add \$11.00 plus purchase price, in U.S. funds.



1953 West 11th Street Upland,CA 91786 (714) 946-5805

© 1982 80-Northwest Publishing, Inc. All rights reserved. Reproduction for other than personal, non-commercial purposes, or further distribution in any other form, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. While every precaution has been taken in the preparation of this publication, the publisher assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of any information contained herein. Please address correspondence to: 80-U.S. Journal, 3838 South Warner Street, Tacoma, Washington 98409, telephone (206) 475-2219.

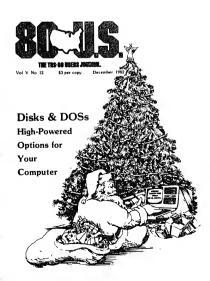
Advertisers: 80-U.S. Journal will accept relevant commercial advertising which pertains to, or is for use on, the Tandy Corporation microcomputers. Write for a current rate schedule.

Authors: We constantly seek material from contributors. Send your material (double spaced, upper/lower case, please) and allow approximately 4 to 6 weeks for review. Programs must be supplied in machine readable form on diskette or tape, clearly marked as to model and operating system. Text files may be on diskette. Media will be returned if return postage is provided. Cartoons and photographs are welcome. Generous compensation will be made for nontrivial works which are accepted for publication. 80-U.S. Journal pays upon acceptance rather than on publication.

SUBSCRIPTION PRICE: U.S.: \$16 for one year, \$31 for two years and \$45 for three years. Canada and Mexico: \$25 per year, no two or three year subscriptions are offered. All other: \$30 per year via surface mail, \$72 per year via airmail. Two and three year subscriptions are not offered.

ISSN Publication #0199-1035. The 80-U.S. Journal is published monthly by 80-Northwest Publishing, Inc., 3838 S. Warner St., Tacoma WA 98409-4698. Printed in the United States of America.

POSTMASTER: Please send change of address form 3579 to 80-U.S. Journal, 5615 West Cermak Road, Cicero, Illinois 60650. Second Class postage PAID at Tacoma. WA and at Aberdeen, SD.



Our cover was designed by Don Snowden of Gig Harbor, WA. He also provided the excellent drawings throughout the magazine.

THE TRS-80 USERS JOURNAL

TRS-80 is a trademark of the Tandy Corp.

Vol. 5, Number 12 - December, 1982

ARTICLES

LDOS

18 Don Scarberry

T. R. Dettmann

Why bother with another DOS? A discussion of the advantages of using a programmer's operating system.

Radio Shack hard disk system

24

A report from users who have installed this system.

Grab TRSDOS by the horns

28

Michael D. Andreas, Charles P. Knight Model I, PMC-80, LNW80 A utility that allows you to run a data disk in drive zero and avoid the expense of a second drive.

EASYLINK

37

For all models

Cameron C. Brown

Now you can connect to Western Union through your TRS-80.

Hard disk for the Model III

40

Model III

Harry Avant

An evaluation of MTI's hard disk and CP/M operating system.

Christmas card

45

Models I/III, PMC-80, LNW80

Santa Claus

MULTIDOS

46

Models I/III, PMC-80, LNW80

Terry Kepner

An evaluation of an extremely versatile operating system.

USRful patch

48

Models I/III, PMC-80, LNW80, no disks A routine that gives you unlimited USR calls. Charles C. Edwards

4 80-U.S. Journal

Driver education 50	REVIEWS
Models I/III, PMC-80, LNW80 A tutorial on how to use device control blocks and create your own driver routines.	Speak 96 Reviewed by Tim Knight
Pocket adventure 54	Crayon 97 Reviewed by Tim Knight
Pocket computer A spoof of adventure games — but it really works. Robert D. Miller	Beta-80 99 Reviewed by Mark Schimelman
DOSPLUS 3.4 and 3.4D Models I/III, PMC-80, LNW80 An operating system that makes density or disk size compatibility easy.	6809 Assembly Language Programming 100 Reviewed by T. R. Dettmann
Color Computer sorting 63	Outhouse 101 Reviewed by Matt Friedenberg
Color Computer A routine for obtaining quick results. Provided in BASIC and machine	Black Sanctum 102 Reviewed by Roy Seney
language.	Electric Webster 102 Reviewed by Jim Klaproth
For all models String functions and what they can do. 58 James A. Conrad	Dunzhin Reviewed by Mark E. Renne
BASIC bits 73 Models I/III, PMC-80, LNW80 Thomas L. Quindry Tips on packing strings more efficiently.	
	DEPARTMENTS
Files and foibles 76 Models I, II, III, PMC-80, LNW80 T. R. Dettmann How to sort large sequential files that exceed your computer's memory.	Editorial By Lawrence I. Charters
	Letters to the Editor 8
Data Ace Model II A review of a powerful relational database manager. 87 T. R. Dettmann	Directions 10 By Mike Schmidt
Treview of a powerful relational database manager.	Notes, etc. 14
Exploring VisiCalc Models I, II, III, PMC-80, LNW80 Timothy K. Bowman	Tandy topics 70 By Ed Juge
Processing text and creating forms.	@ News By Spencer Hall
Screen dump utility 106 Models I/III PMC-80, LNW80 Alfred L. Brophy III	New Products 90
A tiny word processor that provides an exact copy of the screen contents.	Captain 80 By Bob Liddil
Let's have a party For all models Alan Mandell	Advertiser Index 118
Four computerized children's party games.	Bulletin Board 118 December, 1982 5

80-15

Publisher/Editor-in-Chief

I. Mike Schmidt

Editor

Cameron C. Brown

Associate Editors

Terry R. Dettmann Spencer Hall Jim Klaproth

Contributing Editor

Robert W. Liddil

Advertising Sales

Donald Scarberry

Promotion/Circulation

Robert P. Perez

Production

Catherine D. Doud Sherry A. Miksell

Editorial Secretary

Eva R. Jones

Accounting

Helen Dalton

RENEWING?

Check your label to be sure it's correct. For uninterrupted service include your label with your order.

MOVING?

Please enclose your label or write your name and address as it appears on your label.

Name
Address
City/State
Write in new address:
Name
Address
City/State

80-U.S. Journal

Subscription Department 5615 West Cermak Road Cicero, IL 60650

Editorial

I used to think of Radio Shack as nothing more than a somewhat dingy little chain store that gave away free batteries. It seemed that all they sold were CB radios and Made In Hong Kong battery-operated plastic toys that broke after you got them home. In retrospect, it is hard to say if this image ever was true — I never bought a CB or plastic toy — but one thing is certain: Radio Shack is not a dingy little chain store. It is a corporate colossus.

Tandy Corporation (Radio Shack) is now the 20th largest computer firm in the United States, and the top microcomputer company. According to Computer Decisions (June 1982), Tandy's computer revenue for 1981 totalled \$460 million, and its revenue growth rate ranked fourth in the computer field. Compared to IBM's \$25 billion in computer revenues, Tandy's performance seems modest, but, compared to IBM, no one is very impressive. More recent figures (Computer Decision's ranking was based on Tandy revenues ending June 30, 1981) suggest Radio Shack has climbed even higher. Other microcomputer firms in the top 100 included Apple (23rd), Commodore (49th), Warner (Atari; 71st) and Zenith (89th).

Since your average Radio Shack computer is not very expensive, this performance is remarkable. Another industry magazine, ICP Software Business Review (Autumn 1982), reports that Radio Shack is just as potent as a software firm. With revenues of \$38 million in 1981, Tandy was the top microcomputer software supplier in the United States, and ranked 54th when compared with all software firms. The only other microcomputer software companies to hit the top 100 were Vector Graphic (75th), Apple (77th), Commodore (92nd) and Microsoft (93rd).

There are several conclusions you can draw from these figures, but probably the most important one is

By Lawrence I. Charters

this: Radio Shack is not a joke. The microcomputer community long made fun of the "Trash-80," and suggested that Tandy get out of electronics and go back to selling leather goods. Computer magazines and newspapers used to pay so little attention to the TRS-80 that a whole new publishing industry grew up to support it. Independent retailers, busy selling rival computers, often refused to carry any hardware or software for Radio Shack machines. After a time they forgot why they didn't carry such goods, and were able to delude themselves into believing nothing was available. If you go into such a store today and ask for TRS-80 merchandise, vou will often be met with a sad look and a suggestion that you junk your machine and buy a real computer.

Computer snobbery is nothing new, nor is the sales tactic of selling one item by slandering another. What is odd is the lack of loyalty by Radio Shack computer owners and the TRS-80 press. You will rarely find an Apple owner who will admit to any problems with Apple equipment, and Apple magazines are either enthusiastic promoters of Apple, Inc., or carefully neutral. In contrast, one large TRS-80 magazine has made something of a career of criticizing Radio Shack in general and TRS-80s in particular, and TRS-80 owners have never shown any hesitancy when it comes to gripes. There is nothing wrong with healthy criticism, but is this healthy?

One commonly heard complaint is Radio Shack's lack of software support. Looking through their latest computer catalog (which, by the way, is free — some companies make you buy their catalog), it is hard to take this charge seriously. Even the newest member of the Radio Shack stable, the Model 16, has more manufacturer supported software than most microcomputer firms offer for their entire line. Radio Shack's customer service lines, and its company sponsored newsletter,

TRS-80 Microcomputer News (free for a year with every computer purchased), are unique - no other microcomputer firm offers such services.

Radio Shack does have an annoving habit of ignoring the outside world (a typical problem in the computer field), but even this is changing. Their newsletter has recently referred to 80-U.S. articles. explained how to connect various gadgets to TRS-80s, and even detailed how different versions of CP/M might work on the Model II. The NIH (Not Invented Here) syndrome is still stronger than most of us might like, but it is not as severe or as important as some contend.

Radio Shack's repair policies particularly concerning modified machines - have received the most interesting complaints. Almost all computer firms will repair their own machines — provided those machines show no sign of modification or tampering. Considering the complexity of computer machinery, repair technicians are understandably reluctant to risk their equipment and lives - poking around with some unidentified and undocumented modification. If a computer has been modified you are usually invited to look elsewhere for help. (Some companies will even seize your computer - permanently claiming such tampering is equivalent to theft of proprietary material.) Such repair policies are not limited to the computer field, either; try taking a Ford in for repair to a Ford dealer - after you have installed a Chrysler engine. All things considered, Radio Shack's policies are both flexible and reasonable.

Radio Shack has grown from an uncertain, pioneering microcomputer infant into a solid, adult giant. With over a million Radio Shack computers of various types installed worldwide, it is time for the TRS-80 community of owners and users to make a similar transition. Show some loyalty, cameraderie and understanding. Add some wellconsidered praise as well as constructive criticism. It's more fun, and more productive, than ignorant, lonely, peevish grousing.

VI SOFTWARE

Proven Software Solutions for the TRS-80, PMC-80 & 81 User **At VERY Special Prices**

GAMES

Title	List	Our Price	Title	List	Our Price	Title Big 5	List	Our Price
Advanced Operating S + VOYAGE QF THE VAL D 32K & T 16K &	KYRIE 39 95 29 95	32.00 24.00	SCOTT ADAMS' ADV D 32K I & III SCQTT ADAMS' ADV	39.95	31 00	ATTACK FORCE D 32K I & III T 16K I & III	19.95 15.95	15.00 12.00
Adventure Internation ARMOR PATROL			D 32K I & III SCOTT ADAMS' ADV D 32K I & III	39.95 #7, #8 & 39.95	31 00 #9	COSMIC FIGHTER D 32K & III . T 16K & III DEFENSE COMMAND	19.95 15.95	15 00 12 00
D 32K I & III T 16K I & III COMBAT	24 95 19 95	19 00 15 00	SCOTT ADAMS' ADV D 32K I & III SEA DRAGON	39.95	31 00	D 32K I & III T 16K I & III GALAXY INVASION	19 95 15.95	15.00 12 00
D 32K & III T 16K & III CONOUEST OF CHES			D 32K & T 16K & SHOWDOWN	24 95 19 95	19 00 15 00	D 32K I & III T 16K I & III METEOR MISSION	19,95 15,95	15.00 12.00
D 32K &		16 00 15 00	D 32K I & III T 16K I & III + SILVER FLASH-PINB		16 00 12 00	D 32K I & III . T 16K I & III . ROBOT ATTACK	19.95 15.95	15.00 12 00
REIGN OF THE RED D D 32K I & III ELIMINATOR D 32K I & III	24 95 24 95	19 00 19 00	D 32K I & III T 16K I & III SKY WARRIOR	19 95 14 95	15.00 12.00	D 32K I & III T 16K I & III +STELLAR ESCORT	19 95 15 95	15.00 12.00
T 16K I & III GALACTIC EMPIRE T 16K I & III	19 95 14 95	15 00 15 00	D 32K I & III T 16K I & III SPACE INTRUDERS	20 95 14 95	16 00 11 00		19.95 15.95	15.00 12.00
GALACTIC REVOLUTI T 16K I & III		12 00	D 32K I & III T 16K I & III . STAR FIGHTER D 32K I & III	20 95 19 95	16.00 15.00	D 32K I & III T 16K I & III Cornsoft	19.95 15.95	15 00 12 00
T 16K I & III	14.95 39.95	12.00 30.00	T 16K & STAR TREK 3.5 D 32K &	29.95 24 95 19 95	23 00 19 00 15 00	+ BOUNCEOIDS D 32K & III T 16K & III	19.95 15.95	15 00 12 00
LUNAR LANDER D 32K I & III T 16K I & III	20 95 14.95	16 00 11 00	T 16K I & III TREASURE QUEST D 32K I & III	14 95 19 95	11.00	SCARFMAN D 32K I & III T 16K I & III	19 95 15.95	15.00 12.00
MACES & MAGIC #1— D 32K I	29 95	23 00	T 16K I & III Automated Simulatio	14 95 ns (EPY)	11.00 X)	SPACE CASTLE D 32K I & III T 16K I & III	19 95 15 95	15 00 12,00
STONE OF SISYPHUS D 32K I MACES & MAGIC #3-	29.95	23 00	CRUSH, CRUMBLE & D 32K & T 16K &	CHOMP 29 95 29 95	23.00 23.00	Med Systems ASYLUM D 32K I & III	22 95	18 00
MORTON'S FORK D 32K I MISSILE ATTACK	29 95	23 00	DUNJONQUEST— HELLFIRE WARRIOR D 32K I & III	39 95	30 00	T 16K I & III + ASYLUM II D 32K I & III	19 95 22.95	15 00 18 00
D 32K I & III T 16K I & III OTHER VENTURE #2-	20 95 14 95 -	16 00 11 00	T 16K I & III DUNJONQUEST— KEYS OF ACHERON	39 95	30 00	T 16K & . DEATHMAZE 5000 D 32K &	19.95 17.95	15 00 14.00
CROWLEY MANOR D 32K I & III T 16K I & III	20 95 19 95	16 00 15 00	D 32K I & III T 16K I & III DUNJONQUEST—	19 95 19 95	15.00 15.00	T 16K & LABYRINTH D 32K & T 16K &	14.95 17.95 14.95	11.00 14.00 11.00
OTHER VENTURE #3- ESCAPE FROM TRAA D 32K & III T 16K & III		16.00	SORCERER OF SIVA D 32K I & III T 16K I & III . DUNJONQUEST—	29 95 29 95	23 00 23 00		DUNZHIN 29.95 29.95	
OTHER VENTURE #4- EARTHOUAKE SF 190 D 32K I & III	-	15 00	TEMPLE OF APSHAI D 32K I & III T 16K I & III	39 95 39 95	30 00 30 00	WARRIORS OF RAS D 48K I & III		23 00
T 16K I & III OTHER VENTURE #5- + DEATH PLANET	19 95	16 00 15 00	DUNJONQUEST— UPPER REACHES OF D 32K & III			T 48K & WARRIORS OF RAS— D 48K & T 48K &	THE WY 29.95	23 00
T 16K & PLANETOIDS D 32K &	19 95 20 95	15 00 16 00	T 16K & + RICHOCHET D 32K &	19 95	15 00 15 00	Melbourne House Soft PENETRATOR		23 00
T 16K &	19.95	15.00	T 16K I & III	19 95	15.00	D 32K I & III . T 16K I & III	24.95 24.95	20 00 20.00

Now Twice As Many Programs!

EDUCAT Advanced Operating S MOSTLY BASIC			WORD PROC Aspen Software GRAMMATIK	CESSI	1G
EDUCATIONAL PKG. 7	PRG.		D 32K I	59 00	46 00
T 16K I & III .	24 95	20 00	PROOF EDIT		
MOSTLY BASIC			D 32K I	30.00	23.00
SCIENTIFIC PKG, 7 PF T 16K I & III	1G. 24.95	20.00	PROOFREADER D 32K I	54.00	42 00
TIME DUNGEON—	24.95	20.00	SOFT-SCREEN	54.00	42 00
AMERICAN HISTORY			D 48K I	69 00	54 00
T 16K I & III	24 95	20 00	SOFT-TEXT		
TIME DUNGEON			D 48K I .	69.00	54.00
WORLD HISTORY			Michael Shrayer Softw	rare	
T 16K &	24.95	20 00	ELECTRIC PENCIL		
Automated Simulation JABBERTALKY	S (EPYX)		T 16K I	100 00	24 00
D 32K I & III	29.95	23 00	INFO. PROC	FCCIN	i C
T 16K I & III	29 95	23 00	Adventure Internation		IG
1 1011 1 4 111	23 33		+ MAXI CRAS	aı	
			D 48K I & III	99 95	79 00
DUCINIT	-00		MAXI MANAGER		
BUSINE	:55		D 48K I & III	99 95	79 00

+ MAXI CRAS	
D 48K I & III 99 95	79 00
DIICINITOC MAXIMANAGER	
BUSINESS DARKIANAGEH DARKIANII 99 95	79.00
Small Business Systems Group + MAXI MANAGER UTILITY PAC	K #1
ACCOUNTS PAYABLE D 48K I & III 49 95	39 00
D 48K I & III 195 00 155 00 + MAXI STAT	
ACCOUNTS RECEIVABLE D 48K & III 199 95	147 00
D 48K I & III 195 00 155 00 Auk's	
GENERAL LEDGER + COMPUTER FILING SYSTEM	CFS)
D 48K I & III 195 00 155 00 D 32K I & III . 69 00	55 00
NVENTORY CONTROL Dan Haney Associates	
D 48K I & III 195 00 155 00 ELECTRIC SPREADSHEET	
PAYROLL D 32K I & III 69 95	65 00
D 48K I & III 195 00 155 00 T 16K I & III _ 34 95	30.00

OPERAT Micro Systems So DQS PLUS V3 3S D 32K I	ftw	NG SY	S. 80
Adventure Interna	tio	nal	III

+	DIRECTORY INFO MG	T II (DIM	11)
	D 32K I & III .	24 95	19.00
	Howe Software		
	MON3		
	T 16K I	39.95	31 00
	MON4		
	D 32K I	49.95	39.00
	STERM		
	T 16K I	69 95	55 00
	SYSTEM DIAGNOSTIC		
	D 32K I & III	99 95	79.00

80.00

MISCELLANEOUS

	+ NEW	# !	5
,	Software Affair ORCHESTRA-85 T 16K I D 16K I	99 95 99 95	95 00 95 00
,	Adventure Internation HINT SHEET for singl Adventure #1 thru #12	e	1 00

SOFTWARE

475 Ellis St., Mt. View, CA 94043 Orders: (415) 968-1604

Terms FOR FAST DELIVERY, send certified checks, money orders, VISA or MasterCard number and expiration date. Personal checks require 3 weeks U.S.A. sales only PRICES INCLUDE UPS continental delivery (do not use P.O. Box). CALIFORNIA customers add 6½% tax. Prices subject to change

Letters to the editor

I was very pleased to find an article, by Kenneth Smith, in the September issue of your magazine on using the high-resolution graphics available in my Epson MX-100 printer.

My MX-100 is attached to a Model II. That made using

the programs, as published, impossible.

Just type the following from TRSDOS READY:

DEBUG ON <ENTER>

DEBUG <ENTER>

M

F000

<F1> (the 'F1' key)

DB E0 B7 20 FB 7E D3 E1 C9 (spaces added for clarity)

<F2> (the 'F2' key)

 \mathbf{S}

DUMP PRINTCHR (START=F000 END=F008 RORT=R) <ENTER>

DEBUG OFF <ENTER>

Then make these changes to Mr. Smith's programs:

DELETE 280-300

ADD:

50 CLEAR 100,&HEFFF 'protect memory

60 SYSTEM"PRINTCHR" 'loads the routine

70 DEFUSR>&HF000 'set the entry point

280 A=USR(A(I)) 'call the routine

Lowell Johnson Thief River Falls, MN

Thanks for the conversion. -Ed.

Through an article in your magazine, and due to a very positive letter from one of your subscribers, I ordered GEAP (Graphics Editor And Programmer) program from Mr. Joe Fettig of J.F. Consulting, Palm Desert, CA.

The service was fast and I received the GEAP program within a short time. Due to some incompatibility problems with the diskette format I had to return the program. Mr. Fettig sent me the previous GEAP cassette version while he was working on how to get me the latest (and improved) diskette version.

The cassette version of GEAP impressed me and I was, as you can imagine, eagerly looking forward to receiving the GEAP disk version. I have this version working on my Model III and there is good reason to be impressed.

But, the service of Mr. Fettig has impressed me even more...you will not experience better service anywhere.

I've subscribed to 80-U.S. Journal for a year now and my verdict of the magazine is: High-standard articles. Continuously improving and loaded with useful material for us TRS-80 owners. The tutorials almost couldn't be better. My wish for the future: more business application programs and not too much space devoted to reviews of games.

Arnt Kr. Sviland Stavanger, Norway

Excellent service is worthy of note, thanks for letting us know. —Ed.

Let me thank 80 U.S. for reviewing our program SUPER UTILITY PLUS. Mr. Klaproth did a very fair review and we have no problems with his reporting of our features. We appreciate it when others realize the full power of this utility. SU+ is a very comprehensive product, and he highlighted it nicely.

The "source" of the program mentioned in the review was incorrectly listed as Soft Sector Marketing. That may be where Mr. Klaproth purchased his copy, but the real source is PowerSOFT — a division of Breeze/QSD, Inc., 11500 Stemmons Expressway, Suite 125, Dallas, TX 75229.

Soft Sector Marketing is one of our dealers (and a very fine one), but is not the original source.

Let me also add one other minor correction. The price listed in the review was \$49.95. That was a "summer special" that SSM was selling. The retail price of SU+ is \$74.95, and that now includes two diskettes in the package, the MASTER, and a BACKUP copy. A revised manual completes the package. We started including the BACKUP copy as of 9/1/82.

Dennis A. Brent, President Breeze/QSD, Inc. Dallas, TX

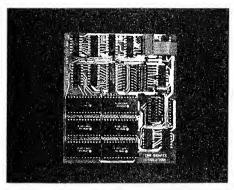
Our apologies for any inconvenience we may have caused. At \$74.95 it is still a bargain. —Ed.

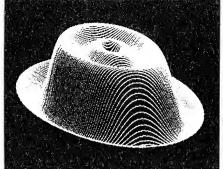
I recently purchased your *The Captain 80 Book of BASIC Adventures* and I am quite pleased with it. However, I do have one question that you might be able to help me with.

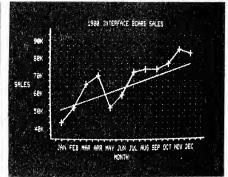
The process of program entry is quite tiring and prone to error on my Osborne I computer. Do you know anyone who might have the programs available in Osborne I disk format?

Terry A. Ward Cedar Falls, IA

Perhaps a reader can help. We have no Osborne's at 80-U.S., just good ole Tandys. —Ed.





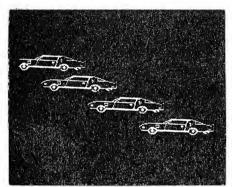


Mod III

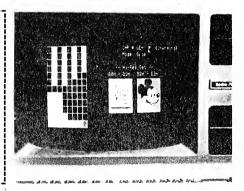
GRAFYX SOLUTION

\$299.95 #6

- 512 × 192 Dot Graphics increases resolution 16 × (better than Apple)
- Extensive Business, Personal, Educational, and Scientific applications
- 14 BASIC commands set and reset Points, Lines, Circles, Boxes, etc.
- Allows Display and Printout of detailed Line, Bar, and Pie graphs
- 80 Character/line display compatible with BASIC programs and DOS
- Price includes 98K bits memory, 30 programs, 52 page manual
- Plug-in, clip-on board eliminates soldering for easy installation







Mod I, III

80-GRAFIX⁶

\$169.95 #7

- Create and Save 128 programmable hi-resolution characters/shapes
- Characters are generated within an 8 \times 12 matrix (Mod I: 6 \times 12)
- Great for creating game figures, symbols, and alternate character sets
- Excellent software support (20 programs) & extensive documentation
- Module easily installs within the computer with no soldering

Manual only \$15 Products guaranteed Dealers welcome

MICRO-LABS, INC. 214-235-0915 902 Pinecrest, Richardson, Texas 75080 FREE shipping Prepaid or COD Tx. res add 5%

Directions

By I. Mike Schmidt, Publisher

Long-time readers may remember when the publisher had a page or so in which to ramble on about everything and anything. Now that we have editors to write editorials, I find myself without a platform, so we created "Directions." There may be times when this page sounds editorial in nature or, it may sound like industry news. Who knows - I may even wax philosophical at times when the spirit strikes. One thing I will not do is pontificate only pontifs are allowed to do that, and I don't even qualify as a minor saint - much less a pope!

What's New at 80-U.S. Journal

The big news at 80-U.S. Journal is that, starting in January, we will be printed entirely on slick, publication enamel paper. Since we are virtually the only TRS-80-exclusive publication left which actually supports the TRS-80 line of computers, we think it's time to enhance our image. It is also the next logical move for our publication to take, especially since our newsstand distribution has increased drastically. (Did you know that we are now available in most B. Dalton stores?)

The slick format will give us more flexibility in the placement of four-color advertising and editorial material. It's part of the growing up process. Some time during 1983, we will probably be perfect bound, which will give further flexibility and the ability to bind in special sections.

Of course, it costs more to do these things, but we take pride in the fact that issue number one had a cover price of \$3, and a subscription price of \$16, and those figures have not changed in four years! I am sure that everyone expected a price increase in January, 1982, when we went to monthly publication, but we held the price then, and will hold it now. The economic situation we live in demands that we hold it. By the way, our 1983 advertising rates will be released shortly, but you may as well look at last year's card, because the

rates remain unchanged. We are committed to making it, in spite of the times, but not at your expense!

All of this is due to your tremendous support. It is numbers that count, and as the numbers go up, the price per each copy goes down, and we intend to pass that right back to those of you who made it possible. Thank you.

Mequon Meeting

A two-day conference was held on September 23 and 24, 1982, near Milwaukee, Wisconsin. It was hosted by Logical Systems, Inc., and was attended by about a dozen industry leaders. Most of the attendees have been engaged in TRS-80 hardware and software support almost since the TRS-80 became a reality back in '77 and '78.

The conference was a chance to get together and examine the present state of the industry and its future. The mixture of ideas and methods which resulted was astounding. I found the conference exciting and all participants believed firmly in the continued well-being of the Radio Shack computer.

Several of the companies showed off new products and handed out samples. Hard disks, new operating systems and the Model 16 were discussed at length. The consensus of the attendees was that, in spite of current economic conditions, the micro industry will continue its healthy growth.

The meeting concluded with a farewell banquet and a thoroughly fine time was had by all. We extend our thanks to Bill Schroeder, of Logical Systems, Inc., for being such a gracious host.

Those in attendance were Roger Billings of LOBO Drives International, John Lancione of Aerocomp, John Harding of Molimerx, Ltd., Dennis Brent and Kim Watt of Breeze/QSD, Inc., Earle Robinson of SoftERware, Roy Soltoff of MISOSYS, Bob Snapp of Snappware, Inc., Renato Reyes of Powersoft, Kirk Hobart of LOBO Drives, Harvard Pennington of IJG and Cam Brown and myself.

Raburn Leaves Microsoft

Vern Raburn, who was vice president of Microsoft Consumer Products Division, has left for personal reasons. Vern, who was with Microsoft since July, 1979, was the first person to open a Byte Shop and helped organize the Byte Shop chain in California prior to coming to Microsoft.

New BASF Service Center

In Seattle, a company which sold BASF disk drives recently went out of business and about 3000 BASF drives were sold at ridiculously low prices. Data Tech/Reliance, Inc., a local company which does drive repair, was being called upon to put many of these drives into working order. Unable to find parts for the drives, Jan Nelson, of Data Tech/Reliance, bought the entire repair stock as well as the rights to distribute and deal for BASF. He is now the only service center for BASF in the United States. If you bought one of the drives and have a problem, Jan's number is (206) 941-3296.

It Works!

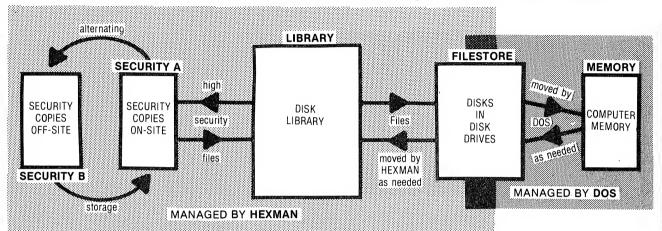
Cam Brown, our editor, recently was asked to help out a local school in selecting some computers for their classrooms. They chose the TRS-80 Color Computer and asked Cam to help them get into operation. As it turns out, the instructors (who had no previous computer experience), followed the "Getting Started" manuals supplied with the computers, and have them running without help. Aside from that, they are enjoying their new computers. Things are definitely looking up when hardware, software and documentation work so well.

Enjoy the upcoming holidays, and remember that good days are made, not had.

HEXMANDIMS.

DISK MANAGEMENT SYSTEM

Computerized file storage and retrieval for your whole disk library.



Your Disk Operating System makes a fine job of managing the files that are in your disk drives. No need to worry about where your old files are kept or where to store new files,

your DOS takes care of it. Now HEXMAN takes over where your DOS leaves off, and extends worry free file storage and retrieval to your whole disk library.

Storage Management

Only a small portion of your disks can be in your disk drives at any one time. These disks form the "Filestore" to which your computer has immediate access, and the remaining disks form you disk "Library". Ideally the "Filestore" should contain the most active files, while inactive files are kept on "Library" disks stored near the computer.

HEXMAN comes as close to this ideal as it can by monitoring file activity and keeping the most frequently used files in the Filestore. If previously inactive files are needed, they are moved in from the Library. If the Filestore becomes full, the least active files are moved out to the Library. The net result is the files you are most likely to use are ready and waiting.

HEXMAN also performs other storage management chores such as daily backups of modified files, on-site and off-site storage of security copies, and file growth monitoring.

File Retrieval

HEXMAN manages up to 8000 files (2000 originals with up to 4 copies of each). If remembering that many eight letter files names gives you a headache — don't worry. HEXMAN gives you two easy ways to find the files you need. With HEXMAN you find files by function e.g. "Get all the files I need for the end of month Sales Reports" or by description e.g. "Find the letter I sent to Radio Shack about my disk drives". HEXMAN finds your files in seconds. Once you have found them you may Review them, Load them or Delete them as needed.

Requirements

Model III - 48K, 2 drives.

Model I — 48K, 2 drives. Double Density adaptor. Lower case modification.

LDOS operating System. If you do not have LDOS, please add \$35 for a copy of the smal-LDOS operating system.



We are sure HEXMAN will become a "must have" program for all serious TRS-80 users. But check it out for yourself. Purchase HEXMAN now and try it out. If you feel you can live without it (unlikely!), return it for a prompt refund less a \$20 evaluation charge.

Offer valid for direct sales only - dealer terms may vary.



WARNING — TIMELOCKED SOFTWARE

This product is timelocked. Unregistered copies will expire at a future date. Registered owners will receive an extension patch when needed.

A NOTE ON CANADIAN MAIL — please allow 5 to 10 days in each direction for mail delivery. For faster service leave your orders or enquiries on our 24-hour answering machine.



P.O. Box 397, Station A Vancouver, B.C. Canada V6C 2N2 Telephone (604) 682-7646 Electronic Mail-Micronet 70235,1376

TAKE A GIANT STEP BEYOND DOS with the HEXMAN Disk Management System

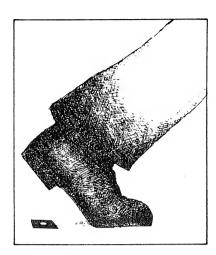
Imagine loading a file whose name you don't know from a disk you can't specify. Imagine creating a file without having to find a disk to store it on. Imagine your computer automatically making those backup copies you know you should have but never get around to. Imagine taking a giant step forward to the HEXMAN Disk Management

The HEXMAN system introduces a new approach to disk management. HEXMAN uses the computer's ability to manipulate large quantities of information to monitor the location and status of all your computer files All of your files are treated as if they were stored in one huge storage space, called the "Library". Only a portion of this storage space is immediately accessible to your computer, and this portion is called the "Filestore"

Filestore and Library

The "Filestore" is kept on disks permanently in the disk drives. Your computer has immediate access to these files. The "Library" is kept on disks stored close to your computer Rather than swap disks in and out of the disk drives as has been done previously, HEXMAN swaps files on and off the diskettes. HEXMAN monitors file activity to ensure that the files in the Filestore are the ones with the highest usuage, and are thus the ones most likely to be needed. When you have a large number of files per disk, this method is much more efficient than swapping a whole disk full of files at a time. Remember that while you are swapping in 30 files to get the one file you need, you are also swapping out 25 files, one of which you may need again later. Just check the files in your disk drives now How many of those files have you used today? With HEXMAN the files you would see on your drives would be the ones you use the

For an example of HEXMAN in action. suppose we wish to review a letter we wrote some months ago, type up some new letters using Scripsit, and continue writing an article we have been working on for some time. We request HEXMAN to load Scripsit, the article, and the old letter into the Filestore, HEXMAN finds that Scripsit and the article are in the Filestore as they have been used recently. The letter is in the Library however, and HEXMAN tells us which Library disk to load while the needed file is moved into Filestore



Backing Up

HEXMAN does more than ensure that the right files are in the right place. It also takes over the tiresome job of making file backups a needed, and retrieving them when we have a problem. After we finish work, the next time HEXMAN analyzes the filestore it will note that some new files have been created. These new files, our freshly written letters, will be added to the Library. The article that has been changed will be updated in the Library by the daily backup routines. Scripsit and the old letter have not been changed, so no backup is made. Over a period of time the letters will be removed from the Filestore, to make room for more active files. If we continue to work on our article it will remain in the Filestore, and be backedup each day as it changes.

Some files are more important than others, and for these files you may specify that an extra copy called the 'Security File'' is to be made, you may even have two Security files. "A" and "B", one of which is kept in a safe place such as a bank vault. Security File A is updated while B is in the bank vault, then A is moved to the bank vault while B is updated. Doing this at regular intervals ensures that vital files are saved even in the event of a fire or other disaster. This level of security is not likely to appeal to the average home computerist, but if you are using your computer for vital business files you should consider it

Finding your files

HEXMAN can track up to 2000 original files with up 4 copies of each, for a total of 8000 files. Making up and remembering 8 letter filenames

becomes quite impractical when dealing with hundreds or thousands of files. In the HEXMAN system you retrieve files by designating the function you wish to perform, or by describing a particular file that you wish to find

In most practical computer applications, more than a single file is needed For example, an accounting system may use several programs linked by menus, and a number of data and transaction files. For word processing you need not only a word processor program, but also some document files to work on, and maybe a Spelling Checker and its associated dictionary files. For this reason, HEXMAN is designed to work with groups of files, rather than a single file at a time. The group of files HEXMAN is currently working with is called the "Active List" This "Active List" may be as large as your whole library or as small as a single file (Sorry to keep introducing buzz words, but there are a number of novel ideas in HEXMAN and we have to call them something!)

Suppose we wish to do an end of the month sales analysis. We ask HEXMAN to find all the files for the function "Monthly Sales" The monthly sales analysis requires a data file plus four print programs HEXMAN therefore makes up an Active List consisting of 5 files. Now we ask HEXMAN to load the Active List into the Filestore, HEXMAN will match the Active List to its list of files in the Filestore. It will report which files are already in the Filestore, then move any missing files in from the Library

Searching by descriptionThe Active List is also used when searching for a file by description. In the HEXMAN system, files are cataloged when they are created, under a variety of headings called "Categories" Categories are defined by the user, and you may have over 500 of them. To make this number of Categories manageable, they are divided into 24 groups called pages, with 24 categories to a page. Pages are labelled "A" thru "X", and categories within a page are "a" thru "x".

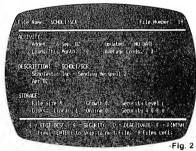
We track down an unknown file by describing the Categories it may or may not belong to While searching for the file, a page full of Categories for us to choose from is shown in the upper half of the secreen An example of the search display is shown in Figure I. To switch to a different page, we simply

press the appropriate upper case letter. Once we are on the correct page, we select the category we want by pressing a lower case letter. The category selected is highlighted, and we press the enter key to confirm our choice.



Suppose we are looking for a letter we sent to Radio Shack about our disk drives. When we cataloged our letters, we filed them under several categories On page D we specified the date of creation, on page S the subject of the letter, on N the name of the person or company it went to. To find our letter we turn to page N and specify that the name of the recipient must begin with "R", then on page S we specify that the subject is "Disks" HEXMAN replies that there are 3 letters that fit in both categories. This is a small enough number to call in the Review program.

The Review program gives us a screen full of information on each file in the Active List (See Figure 2) This includes Storage and Activity information, and a file description HEXMAN allows up to three lines of description for each file, enough to clearly identify the exact letter we want We "deactivate" the remaining files on the Active List, and ask HEXMAN to load in the chosen file



The Electronic Filing cabinet

We hope the above description will give you some idea of the power of the HEXMAN system. The effectiveness of HEXMAN depends on the number of diskettes you have in your library, how much disk storage you have (your Filestore) and your pattern of file usuage. If you have a standard Model III with two 40-track disk drives, a large mailing list that takes up an entire disk would not be a suitable file to include in your HEXMAN library. On the other hand, if you have a large file of

correspondence, HEXMAN can make an effective electronic filing cabinet out of such a system

Suppose you can get eighty or a hundred letters on a diskette Twenty or twenty-five diskettes can hold 2000 letters HEXMAN can ensure that the hundred most frequently accessed letters are on the computer, and can retrieve any of the other 2000 letters from the disk library using its advanced search functions. Buying twenty diskettes is probably cheaper than a filing cabinet to hold 2000 pieces of paper, and a lot smaller too With HEXMAN the electronic filing cabinet becomes a practical reality.

Hard Disk

So far we have been discussing HEXMAN in the context of a floppy disk system. We believe however that most serious TRS-80 users will move to hard disks in the next few years. HEXMAN has been designed with this move in mind.

On a hard disk system it is likely that most of your files will be in the Filestore, i.e. the hard disk. The Library becomes less an overflow for the Filestore, and more a backup for the Filestore HEXMAN's automatic daily backup routines ensure that all your file backups are never more than a day out of date, vet only the few files that have changed are backed up each day. No need to worry about where a backup will be stored, HEXMAN takes care of it. If a file needs recovery, HEXMAN quickly selects the correct Library disk. If your hard disk crashes completely, no need to reload all the files HEXMAN will detect that the filestore is empty and begin reloading files from the Library as they are needed. And when it comes to finding the file you want, HEXMAN's search routines are ready and waiting

Try it — you'll like it

We aren't claiming that HEXMAN is perfect for everyone. We have all seen programs that work well for someone else, but don't work out for us. The only way to see if HEXMAN is the program you need is to use it. We are making a unprecedented 90-day trial offer to give you the chance to do just that. When you purchase HEXMAN you have up to 90 days to use the program as much as you wish If you return the program within 90 days of shipping we will promptly refund your money, less a \$20 charge. The charge covers the cost of the manual and diskettes, which we don't expect to be in a resaleable condition after 90 days of use!. We should point out here that HEXMAN is a TIMELOCKED program, in case someone should think of returning the program and keeping a copy. At a certain date in the future the program will cease to function correctly. Long before this happens registered owners will receive an upgrade patch to the timelock, but anyone with an unregistered copy could run into trouble

HEXMAN works closely with the Disk Operating System. Because of this, we are releasing HEXMAN under just one operating system, LDOS, LDOS has the selection of features most useful to HEXMAN, and we believe Radio Shack's recent decision to sell LDOS will make it the most widely available of the advanced TRS-80 Operating Systems. If you do not have LDOS we have arranged with Logical Systems Inc. to distribute smal-LDOS, a mini version of LDOS, with the HEXMAN system. If you need it, smal-LDOS must be ordered at the same time as your HEXMAN system, and costs an additional \$35. Please note if you have a Model I that you need a double-density adapter to run HEXMAN, without it you are unlikely to have enough disk storage

Updates, and HEXMAN +

While we won't guarantee HEXMAN to be perfect, we do intend to support our product HEXMAN is a complex system, dealing with the real world. The real world is a dynamic place, always producing novel situations and unexpected events. To meet this challenge, we expect HEXMAN to grow and change over time, and will be offering occasional updates at a nominal cost. Because this growth is likely to be greatest early in the life of the program, we will guarantee at least one FREE upgrade to purchasers of Version 1

During the development of HEXMAN we tried out many nice features that didn't make it into the standard package. Only features that are essential to an effective system have been included. Too many fancy features, no matter how nice, confuse the novice user and in the end are counter productive. Once we develop a base of experienced HEXMAN users we will be releasing an extension package called "HEXMAN + ". This package, for which there will be an additional charge, will add many powerful features to the standard HEXMAN package. When you are ready to trade the simplicity and ease of use of the standard system for the power and flexibility of an advanced system, HEXMAN+ will be there.

Finally

Order HEXMAN today, direct from Hexagon Systems or from your nearest Hexagon Systems dealer. And take a giant step forward into computerized disk file management.



Notes, etc.

There has been talk in other journals that Radio Shack service is not as good as it should be. Our experience has been to the contrary. A letter was sent to us from a reader regarding the problem with a single drive copy from single density to double density when the Model I double density disk kit had been installed.

Within eleven days, we had a response from Tandy that the problem was valid and that a new diskette is in production and should be available by the time you read this. The Model I double density disk kit will now be sold with version 2.8, which corrects the single drive copy problem. Owners of version 2.7 can return their diskette for the new release under Radio Shack's standard exchange procedures. I call that quick, excellent response. Who said they don't care?

Things we would like to see

Every month we are sent a number of articles and programs for possible publication. I would like to give you some hints if you are considering sending material to us. First, keep it brief. A twenty-sevenpage submission on using NEWDOS/80 igel files may be important, but it takes up too much editorial space. Short and useful utilities, patches and subroutines are always popular. Second, try not to be too dependent on a specific operating system or peripheral. The wider the audience, the greater your chances of being accepted.

How about an article on simulations, art, music, health? A tutorial on using DEBUG, Model II graphics, a complete Color Computer function grapher, networking within an office environment, etc., would be useful.

As Mike points out in his Directions column, we will be printing on publication enamel in January. Besides giving four-color

capability to our advertisers, it also gives editorial the same ability. So, for our writers out there, feel free to submit color photos or slides with your articles. We would love to run them.

Mr. William H. Moore of Milwaukee, Wisconsin, wrote to see if any of our readers are aware of the TRS-80 being used in any political campaigns. He points out that the politician's need for word processing, fund raising, voter analysis and voter targeting, are perfect for a computer. If any of you have such information, forward an article or report to 80-U.S. Journal. It strikes us as a subject worth reading about. We can see it now ... "TRS-80 leads way to White House."

Simple Joe-September, 1982

Mr. Dan Sitch of Pittsburg, New Hampshire, dropped us a note that converts the Simple Joe program by Mr. Ron Goodman to work on the Model III. Only three lines have to be changed. The last part of line 110 should read: IF A=109 THEN M=1 ELSE M=0. Change the beginning of line 130 to read: IF A=109, and the beginning of line 140 to read: IF A=237. When you run the program, the numbers that Mr. Goodman refers to in paragraph four will show up as 104 and 232. A good mix of these numbers will have Joe working just fine on the Model III.

Corrections

We were getting the impression that you had stopped typing in the programs, and then some letters started arriving. For the article "Restore your data pointer" by Thomas L. Quindry, October 1982, there is a slight error in a remark on line 2 of Listing 1. The variable Z2 should equal INT(Z3/256) not the 246, as was stated.

In the article "High-resolution graphics" by Kenneth R. Smith, September 1982, a small correction needs to be made for it to work correctly on the Model I. It turns out that Mr. Smith's method for checking printer ready status would only work on the Model III. By changing line 280 to: 280 IF (PEEK (14312) AND 240) <> 48 THEN 280, it should work on both models.

We got a number of letters regarding the program "PRINT to LPRINT," October 1982, by Roy B. Harrill. Mr. Harrill's program is a little too efficient. It will imbed a PRINT or LPRINT code within a line number or BASIC pointer when it does the conversion. We missed this only because we worked the program on a short sample listing and our line numbers did not (luckily?) coincide with codes that were being converted.

Mr. Wilfred O. Duran of Valencia, Venezuela, sent in an easy patch for the program. His letter said: . . . In a normal BASIC program, a byte with a zero cannot appear inside a line. It is used as an end-of-line marker and it may also appear in the four bytes preceeding each line. The easiest way to change the routine by Mr. Harrill is to get rid of the unwanted tokens by changing line 5020 to be: 5020 FOR X=B+4 TO E. This will avoid the first four bytes, and then add a line 5025 that will avoid all other unwanted tokens. Insert line 5025 to be: 5025 IF PEEK(X) = 0 THEN X=X+5.

December Puzzler

Before going into this month's puzzler, here is our winner to Puzzler #1, October 1982. Mr. Ron Goodman of North Hollywood, CA, submitted this following code:

- 5 'OCTOBER PUZZLER ANSWER
- 6 BY RON GOODMAN
- 10 DEFINT A-Z
- 20 FOR X=1 TO 7
- 3∅ A\$(X)=MID\$("HALOWEN",X,1)

4Ø NEXT X 50 FOR X=1 TO 9 PRINT A\$(A(X));70 NEXT X 80 PRINT, 90 X=1 100 A(X) = A(X) + 1110 IF A(X)=8 THEN A(X)=1: X=X+1 ELSE 50 120 IF X=10 THEN END ELSE 100

According to Mr. Goodman, it works on a base 7 concept. The digits are stored in A(1) thru A(9) and line 10 sets up the characters 'HALOWEN' in the array A\$. The letters L and E don't need to be doubled because all combinations will still result.

The answer does give some extra results, such as HHH, but all possible combinations are given. From the submissions, his was the briefest, most organized in output. and closest to what we were looking for. Congratulations.

Puzzler #3

This time, we are looking for the etymology of the word "debug." Who said it first, and in what context? Send your answer to Puzzler, 80-U.S. Journal, 3838 South Warner Street, Tacoma, WA 98409. Winners receive \$10, notoriety, and a free tour of our facilities (you pay transportation).

In This Issue

Disks and DOSs is the theme this month, and we have a number of reports for you. Don Scarberry leads off with a discussion of why even bother with another DOS. Contrary to what he says, he is an LDOS lover. Terry Kepner tells us about MULTIDOS, while Cpt. Paul Hine takes a look at DOSPLUS. We have two investigations of hard disk systems, with Terry Dettmann giving a user's view of the Radio Shack Hard Disk for the Model II, and Harry Avant looks at MTI's offering for the Model III.

I had an opportunity to look at

Easylink and thought you might like to know about this new offering, plus this editor wanted to brush up on his reporting skills. If you are a single disk drive owner, be sure to look at the article by Charles Knight and Michael Andreas. It may save you from having to get another drive. Charles Edwards gives Level II users something that even disk owners can't have - unlimited USR calls. Bob Bowker presents an article on drivers that is truly informative. For Color Computerists, we have an excellent sort utility, in BASIC and machine language. Don't forget to use Alan Mandell's party programs. They are for all models and should amuse the

No matter what machine you own, be sure to check out Basically BASIC, BASIC bits, Files and foibles and our other departments. For fun, don't miss Captain 80 or our gift to you entitled Christmas card.

Enjoy your holidays and may your new year be grand.



WRITER GEAR

Another GEAP expansion module for Epson Graftrax Owners AND NOW — TRUE PROPORTIONAL PRINT ON YOUR EPSON!



FEATURES: GEAPCHARACTER FONTS of Create High Res Drawings without TRS-80 modifications or programming knowledge of Create or modify fonts print time options such as magnify, dot, spacing control, reverse and more of Library function allows saving to disk, printing or re-editing of proportional spacing and SAMPLES - High Res

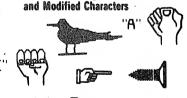
SAMPLE CHARACTER FONTS

abro

ABCD ABCDE abcd HICROPRINT

ENHANCED





ADDITIONAL FONT

ABCDEFGHIJK

ABCD about fghijk lmnopgrat Style



GEAP - The ULTIMATE in TRS-80 Graphics GEAP 2.1 has instant graphic letters Create your own screen graphics easily by; Magnifying, Reversing, Multiplying, Rotating, Merging and much more. Then let GEAP CREATE a BASIC program to recreate your graphic masterpiece! Numerous EXPANSION modules give GEAP limitless power EPSON/OKIDATA/ Radio Shack LPVI printer block graphics, Radio Shack LPVI graphics ready soon! QUICKCURSOR with 2, speed controllable cursors, instant line, rectangle and circle. NEWSCRIPT interactive expansion module. Much more! There is NO other graphic utility on the market that is as POWERFUL, VERSATILE and EASY TO USE as GEAP 2.1

JF Consulting

West Coast 74355 Buttonwood Palm Desert, Ca. 92260 MOD 1/111 (714) 340-5471

East Coast 221 Hirschfield Dr. WilliamsvIlle, NY 14221 (716) 634-3026

OOT WRITER - The UNOISPUTEO leader in HIGH RESOLUTION graphics. Numerous Special Hi-Res Type Fonts for your Epson MX 80/100. Many more fonts being readied now or CREATE YOUR OWN type fonts or HI-RES graphics. No hardware or modifications needed! AND NOW. TRUE PROPORTIONAL PRINT using your Epson Printer, AND, proportional print works with almost all of our SPECIAL type fonts! OOT WRITER + SEAP 2.1, turns your TRS-80 and EPSON into a Hi-Res Graphic TYPESETTER! Requires 48K, Oisk and Epson MX 80/100 with Graftrax 80/100/PULS GRAFTRAX available for easy home installation. GEAP 2.1 + OOT WRITER

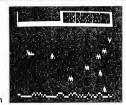
OUT WRITER I.5 only (includes 11 lonts)
EXTRA Fonts Available . \$30 lor disk of 7-10 lonts
We also carry NEWSCRIPT 7.0. The best TRS-80 Word Processor. \$124.95; FASTER, BASIC code optimizer \$25.95 and RPM, Disk Speed monitoring program \$24.95.

YOU CAN'T BEAT GEAP!

MC/VISA



Fun For The Holidays With



DEMISE

Shoot down the enemy ships which are coming-and firing-at you. After obliterating them all, you must carefully navigate a tunnel before you are in the clear. You can move your ship left, right, up, down and diagonally; your weapons include a laser cannon and "smart bombs" that render all ships on the screen impotent. You start with 5 ships and get another ship and "smart bomb" for each 10,000 points. 3 levels of play; great sound effects.

16K Tape or Disk, \$19.95



SPACE ROCKS

By Steven Kearns from Acorn

Gigantic antimatter rocks appear on the Tactical Display Screen of your spacecraft. You blast away with lasers and they just explode into smaller chunks. To score in this fast arcade game with sound, you must destroy the rocks. To stay in the game at all, you must avoid them!

16K Tape or Disk, \$19.95

KING OF THE JUNGLE



By Vandewalle from Acorn

An unusual combination of fast pinball action plus the challenges and dangers of an arcade game. Keep the ball in play, scoring points as it caroms from obstacle to obstacle, while wandering through the jungle searching for the hidden crown. And try to avoid the deadly Cobra. Lots of action, sound and fun! Choice of 3 screens. Can be used with Trisstick

16K Tape or Disk, \$19.95



EVADE

By Knight from Acorn

You're in charge of the USS Krestan, an interstellar tri-ship. If you defeat the enemy aliens you encounter, you get a chance to earn extra points by successfully docking with a larger ship. Then come the evil Mallclans and dangerous meteor showers. Never a dull moment with this one!

16K Tape or Disk, \$19.95

ENEMY EVASION

By Raul Rivera from Acorn An original fast-paced arcade style game requiring quick mental and physical reflexes. You must control your Rover to avoid oncoming Rovelan Ramcraft. You gain points for each successful pass through the 'death lanes", but the Ramcraft speed increases as you play. If you reach the double bonus mode, watch out for the land pellets they drop! Joystick compatible.

32K Disk, \$19.95



By John Allen from Acorn

Once you load ASTROBALL into your TRS-80, the arrow keys become flipper buttons, the screen becomes the play board, and you become the "Pinball Wizard!" A flying saucer, spaceships, meteors, and black holes add to the fun as your ball realistically zings around the board. Five skill levels.

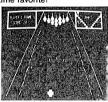
16K Tape or Disk, \$19.95



Also avallable:

PINBALL: The all-time favorite!

16K Tape, \$14.95 16K Disk, \$20.95



TENPINS

By John Allen from Acorn

TENPINS brings you all the thrills of championship bowling. Up to 4 players participate, and the program automatically senses the skill of each. Beginners can position the ball and "roll" it, while more skilled players can vary the force, roll a curve and cause the ball to spin as it heads for the pins. PLUS 3-D graphics and sound effects-realistic and challenging.

16K Tape, \$14.95 32K Disk, \$20.95



Also avallable:

16K Tape, \$14.95

BASKETBALL: You'll have to be fast! 32K Disk, \$20.95

From Soft Sector Marketing

This is the fast action arcade game you've been waiting to play at home! You must hit mushrooms and caterpillars—segment by segment—moths and tum-ble bugs. The challenges: they are all moving; when hit they split into additional segments or metamorphose into different shapes; when you destroy a caterpillar, the new one that replaces it is a segment longer than

16K Tape, \$15.95 32K Disk, \$19.95

OUTHOUSE

From Soft Sector

Isn't there anywhere that's safe these days? Now they're invading the OUTHOUSE, trying to steal the paper supply. But watch out...when the paper is gone, so are you!!! If that's not enough, they're firing at you from the sky! With sound; disk version "talks". Joystick compatible.

16K Tape, \$15.95 32K Disk, \$19.95



SKY SWEEP

By Mark Barlow from Soft Sector

You are flying above an ever-changing terrain, with only your skill, speed, and maybe a little luck to help you avoid the missiles and gunfire coming at you. If you succeed, you must enter an ominous where more danger awaits you. Not for the timld.

16K Tape, \$15.95 32K Disk, \$19.95

By Larry Ashmun from Soft Sector

You are in charge of a massive fortress. Your main priority is to defend it against alien attackers. With your protection and firepower, fending off the first attackers is like swatting flies—but just walt!

16K Tape, \$15.95

32K Disk, \$19.95

Coming Soon:

CHICKEN: Fast action; lots of squawkingi 16K Tape, \$29.95

Over 1500 Programs for TRS-80,

For Information Call 202-363-9797

Visit our other stores: 829 Bethel Rd., Columbus OH Seven Corners Center, Falls Church, VA W. Bell Plaza, 6600 Security Blvd., Baltimore MD



ATARI 400/800, APPLE & IBM.

To Order Call Toll-Free VISA 800-424-2738

MAIL ORDERS: Send check or M.O. for total purchase price, plus \$2.00 postage & handling. D.C., MD. & VA.: add sales tax. Charge cards: include all embossed information

4200 Wisconsin Avenue, NW, Dept. 8-212 Box 9609 Washington, D.C. 20016

Dur Sensational Software



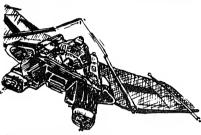
ARMORED PATROL



By Westmoreiand & Gliman from Adventure As commander of a lumbering T-36 tank you have the firepower to destroy the enemy-if you can find them. They may be hiding behind the houses scattered about, the bleak terrain and your only view is thru the drivers port (your screen). Impressive animation in this arcade

16K Tape, \$19.95

32K Disk, \$24.95



STARFIGHTER

By Sparky Starks from Adventure Int.

As mercenary and galactic police officer, you must maintain the condition and control of all parts of your spacecraft. You sit at the controls while peering out of the digital spaceview port. Suddenly something appears on your screen: Is it a Starpirate or a friendly merchant ship? You can't tell yet, and at this speed you may have only a fraction of a second to make an attack/no attack

16K Tape, \$24.95

32K Disk. \$29.95

SEA DRAGON



By Westmoreland & Gilman from Adventure Underwater adventure is yours as you command a nuclear sub armed with deadly missiles and torpedoes. Guide It carefully through sea mines and underwater mountains; watch out for depth charges being fired by overhead ships...and don't run out of alr! Scrolling sea bottom for added excitement.
Joystick compatible.

16K Tape, \$19.95 32K Disk, \$24.95



ELIMINATOR

Westmoreland & Gilman from A.i.

You'll need all your keyboard manipulative skills to keep up with the action in this arcade game. You travel across the planet's low-altitude airspace in an effort to prevent the marauding enemy from capturing your energizer cells. All manner of alien craft await your arrival with destructive forces. For 1 or 2 players, with sound.

16K Tape, \$19.95

32K Disk, \$24.95

STRIKE FORCE



From Melbourne House You are the warrior-savior of cities under relentless allen attack. You're armed with rapid-fire missiles, radar and incendiary star-shells, but you'll need your fastest thinking and instantaneous response to protect yourself and your people. Great real-time graphics

16K Tape, \$15.95

32K Disk. \$19.95

PENETRATOR

From Meibourne House

Armed with missiles and bombs, you must fighter to the enemy's cache of neutron bombs and destroy them. Your mission is in four stages, involving rugged terrain, caverns and manmade obstacles to mention enemy radar, missiles and paratroopers. This new departure in arcade gaming allows you to set up your own terrain and enemy emplacements, then save them for future use. Make your mission as hard or easy as you like Joystick compatible

16K Tape or 32K Disk, \$24.95



PANIK

By Demas from Fantastic

An arcade style game of a fascinating future world with high-res graphics and voice. Filled with action and excitement; in machine language

16K Tape, \$19.95

32K Disk, \$24.95



VENTURE

By Phlijip Case from Horizons

Set off on a journey Into the stronghold of an ancient wizard. Danger Is everywhere, and the penalty for a mistake may be complete destruction! The ultimate chailenge lies in the forbidden Riddle Room-are you ready for the VENTURE? With sound effects; joystick compatible.

16K Tape, \$14.95

16K Disk, \$19.95

DEFENSE



16K Tape, \$15.95 32K Disk, \$19.95 Now Thru Dec. 10: Tape \$14.36; Disk \$17.96



STELLAR **ESCORT**

By Jeff Zinn from Big Five

This new arcade game from Big Five continues their tradition of bringing you the most exciting action in innovative space games. Your fighting spacecraft must run the gauntlet of the attacking alien's weaponry in order to accomplish your defense mission. You'll use all your skill and dexterity just to survive! Joystick compatible.

16K Tape, \$15.95 32K Disk, \$49.95 Now Thru Dec. 10: Tape \$14.36; Disk \$17.96

ROBOT ATTACK

By Hogue & Konyu from Big-Five
One of the top names In TRS-80 arcade games adds a new dimension: voice sound effects! It's you against the robots in this fast-moving shoot-em-up. Electrified Mazes and the "Fiagship" complicate things as you staik the evil androlds.
The innovations built into ROBOT ATTACK take your

TRS-80 near the limits of its capabilities. You MUST see and hear it! Joystick compatible.

16K Tape, \$15:95 32K Disk, \$19:95 Now Thru Dec. 10: Tape \$14.36; Disk \$17.96

Four From Big-Five

By Hogue & Konyu

COSMIC FIGHTER GALAXY INVASION METEOR MISSION 2 ATTACK FORCE!



Each:

16K Tape, \$15.95 Now Thru Dec. 10: Tape \$14.36; Disk \$17.96

32K Disk, \$10.95

THE PROGRAM STORE • Dept. 8-212 • Box 9609 • 4200 Wisconsin Avenue, NW • Washington, D.C. 20016							
Item	Tape/Disk/Book	Price	Postage Total	•	Name		
			☐ CHECK ☐ MASTER	☐ VISA CARD	City Card#	State	ZipExp

LDOS

Why bother with another DOS?

Don Scarberry

When a customer goes to a Radio Shack computer center to purchase a microcomputer he is immediately confronted with the problem of selecting one which contains features suitable for his needs. Due to the multitude of options, the customer soon discovers that he must rely heavily on his own instinct. Shopping for a microcomputer is very much like shopping for an automobile. There is a basic, no frills, unit available which sells for a very modest price and contains very limited computing capability. By adding this or that peripheral, a customer can usually obtain a system which will perform as intended — for a price of course.

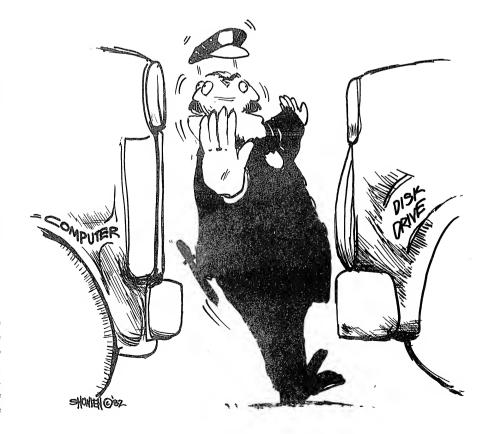
Because of the large storage capacity and rapid access speed, one of the most needed or desired options is a disk drive (or two). A disk system offers greater speed, reliability, flexibility, substantially more storage capacity than cassette systems and is absolutely necessary for any serious business or educational applications. Usually, purchase of a disk drive option will include a Disk Operating System (DOS). A Radio Shack disk-based system will include an operating system called TRSDOS (pronounced TrissDos), an acronym for Tandy Radio Shack Disk Operating System.

A disk operating system can be viewed as a traffic cop which controls the flow of data between the computer and the disk drives. The computer must be able to manipulate data flow in an organized and useful manner and TRSDOS is provided in order to take care of all the necessary chores. The

computer must be able to tell the disk drives where to store your files and, once stored, where to go to retrieve them. Without an operating system to control the complex activity that takes place between the computer and disk drives, a crash will be inevitable. It is comforting to know that all the complex control functions, provided by the operating system, are virtually invisible to you, thus freeing you for more productive endeavors.

TRSDOS, with all its power and complexity, is what I call a minimal operating system. It gets the job

done but without any frills, bells or whistles. There are many other DOSs available which are more complex and provide much more flexibility than TRSDOS. There is NEWDOS/80, DOSPLUS, MULTI-DOS. LDOS and MEGADOS 5 (where have I heard of MEGADOS?) to name a few. All (except MEGADOS 5) are excellent operating systems in their own right and much more powerful than TRSDOS - but then, they were designed to be. These operating systems will provide the user with much more computing power with



18 80-U.S. Journal



Our Users asked for it, and we made the best TRS-80 disk assembler even better! Now M-ZAL has:

- Recursive MACROS with full symbolic parameter substitution
- Conditional assembly with unlimited nesting
- Text Editor warm-start/recovery option
- Support for all popular source file formats
- Load Module inspect/superzap using LINKER

and the features that made it famous:

- True multi-pass assembly
- Full Screen Option Menus
- ENTRY/EXTERN symbols, relocation, and object module linking
- 8 character labels with sorted symbol table.
- Built-in symbol table cross-reference
- Nested *INCLUDES (source file chaining/nesting)
- Lower case support (Model 3 only)
- Over 175 pages of documentation including Z-80 Technical Manual
- Full Screen Text Editing and much, much more!

M-ZAL provides a modular, structured development environment that makes programming your TRS-80 a truly enjoyable experience. Order yours today. (Requires 32k, 2 disk system)

> #1050-10 Mod 1 \$149.00 #1250-10 Mod 3 \$149.00

CAU Development Software— The Professionals Choice:

Full Screen Text Editor for BASIC: we were the first to give the TRS-80 this indispensable ability! A must for every BASIC programmer:

#1210-20 Mod 1 & 3 \$29.95

T-ZAL: custom designed for the Model 3, this tape based assembler has many of M-ZAL's most desired features.

#1250-20 Mod 3 only \$49.95

XBUG: for machine language analysis and debugging—this tiny (2.5k) but powerful program lets you do it all!

#1020-10 Mod 1 \$19.95 #1220-10 Mod 3 \$19.95

FILEXFER: transfer any disk file between two TRS-80s. Use direct cable link or RS modems. Mod 1 and Mod 3 can be mixed. RS-232 and disk regd.

#1040-10

Mod 1 and 3

\$49.05

10

worth its weight in gold."

—Chuck Tesler
PROSOFT

"...Well written software that is long
overdue."

—Bruce Douglass

"We've been using M-ZAL heavily for

over two months now, and it's been

—Bruce Douglass 80 Microcomputing BASIC Editor Review

"During the first 3 days of use, M-ZAL saved more money in programmers time than we had paid for the product."

—William Depman

-William Denman Author of Asylum MED SYSTEMS

"The editor has at least doubled my productive capacity...Having spent a good deal of money on so called utilities' that don't work, it's a delight to find one that not only lives up to its claims but surpasses the advertising."

-BASIC Editor user

Our choice for the best TRS-80 DOS:

DOSPLUS 3.4 Mod 1 \$149.00 DOSPLUS 3.4 Mod 3 \$149.00

Call or write for more information.
All products require level II.
Mail orders specify catalog #.
Send check, money order, or MC/VISA numbers and expiration date to:

Computer Applications Unlimited P.O. Box 214, Dept. ABO Rye, New York 10580 (914) 937 6286

N.Y./ State residents add applicable sales tax. Outside USA and Canada add \$10.00 shipping. Dealer Inquiries Invited.







TRS-80 is a TM of Tandy Corp. M-ZAL is a TM of CAU, Inc. Z-80 is a TM of Zilog, Inc.

the TRS-80 than is provided by TRSDOS. This is perhaps the reason Radio Shack has decided to offer another, non-Radio Shack, operating system for the TRS-80 Models I and III. They must have realized that there is need for a more powerful disk operating system than the stock version of TRSDOS. Indeed, there is. That is the very reason other operating systems have been so successful. They fill a very real need.

The Models I and III will still come equipped with TRSDOS as standard equipment. The optional operating system chosen by Radio Shack is LDOS. By optional, I mean that you'll have to pay extra to enjoy the benefits offered by this operating system. The question that will arise immediately in a customer's mind is whether or not LDOS is for him. The answer to that is quite simple if he knows the difference between TRSDOS and LDOS and understands what his needs are. Generally, a customer will have a pretty good idea of what he wants a computer to accomplish for him. He can also experience, first hand, what TRSDOS will or will not do — the operating system comes with the computer. But, how can he justify purchasing a different operating system like LDOS if he doesn't know how it differs from TRSDOS? To cope with this problem I'll single out some of the special features of LDOS and explain how they differ from TRSDOS.

LDOS is considered to be a deviceindependent system. Each device
the system uses has its own control
area of memory. This is true for
hardware devices actually
connected to the system or phantom
devices created by the user. Device
independence makes it possible to
route devices from one to another or
to disk files. You may re-direct the
input/output of data between the
system, its devices, and the disk
drives in almost any way
imaginable.

Assume you wish hardcopy of a file but someone has borrowed the printer. Further imagine that someone else needs to use the computer that currently contains the file you need printed. What do you do? With LDOS you can simply

tell the computer to treat a disk drive as the printer, and print the file. Later, when the printer is available, you can come back and tell the disk to print the file to the printer. It's true that this can be done with TRSDOS and a Model III, but LDOS will let you do it on a Model I also. To further illustrate the power of LDOS let's use another example.

TRSDOS for the Model III contains a FORMS command which enables you to establish the number of columns of print on a line printer before wrap-around occurs. This is a flawed command that Radio Shack claims will go uncorrected. Seems that in order to get a forty-column print-out, you must set the FORMS command to two less characters than what you will need - in this case thirty-eight. This function actually works correctly with LDOS and there is some additional flexibility not found with TRSDOS. Suppose you wish to list a BASIC program, formatted to forty columns, and have each successive line, after the line number, indented. With LDOS you can indent any number of characters you desire. If all this seems too trivial then let's take a few more complex functions and illustrate the differences between TRSDOS and LDOS.

Assume you just saw an extremely bot price on some eight-inch floppy disk drives. The price is so unbelievably low that you can't pass it up. If you stay with TRSDOS you'll have to kiss this deal goodbye. LDOS will allow you to use the eight-inch floppys on your Model I or III with ease. And LDOS will allow you to keep your 51/4-inch floppys on-line simultaneously. That's right! You will be able to intermix 51/4-inch floppys and eight-inch floppys on the same computer. You can use single density single-sided, double density double-sided, 35, 40 or 80-track drives if desired. You can use disk drive configurations I didn't even mention. Here's the sweet meat. Recently those five and tenmegabyte hard disk drives have dropped in price quite dramatically. So what, you say? Your TRSDOS holding you back? With LDOS there's no problem. Buy the hard disk and hook it up. LDOS will provide you with a seemingly bottomless well for storage of your files. I have even seen hard disks being sold which come equipped with LDOS. Must tell you something, right? Now, that's flexibility!

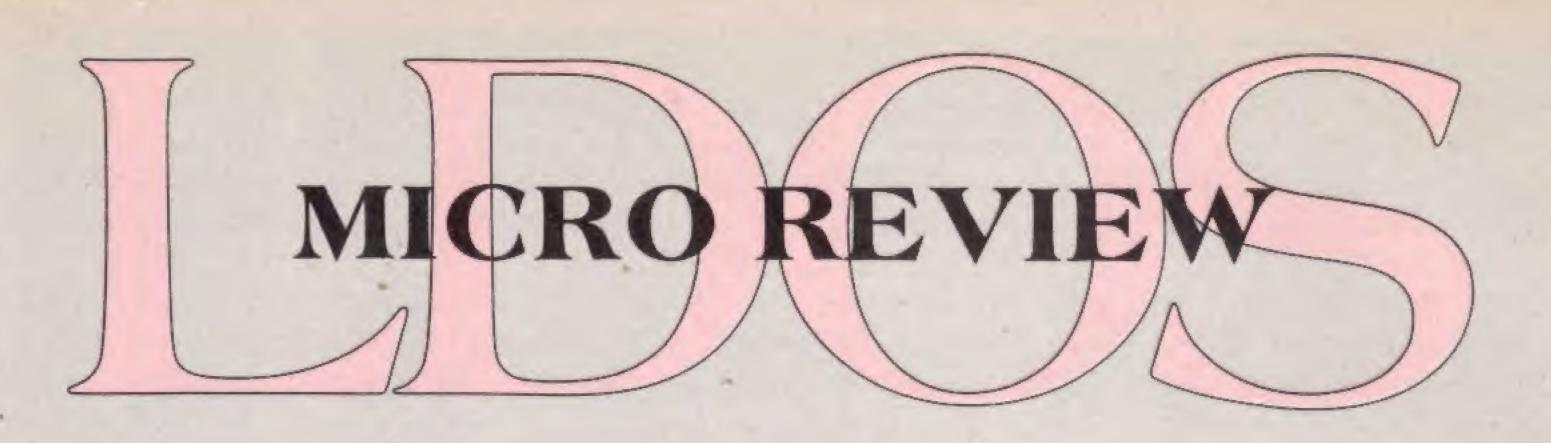
Virtually every command or function that TRSDOS offers is found in LDOS, LDOS, however, offers many more. This equates directly to more computing power and flexibility. Practically all the commands contained in TRSDOS are expanded substantially by LDOS. LDOS provides for system growth where TRSDOS does not! Your TRS-80 will not become obsolete as quickly as it would if you confined yourself to TRSDOS. In fact, TRSDOS is dwarfed by all the capabilities of LDOS. You could strip away roughly half of the capabilities of LDOS and still have a system as powerful as TRSDOS in its present state.

Next time you are in a Radio Shack store and see LDOS sitting on the shelf pick up the manual and browse through it. I think you will agree that it is probably the most comprehensive piece of documentation on the market today. If, after looking over the manual, you are still undecided whether LDOS is for you then consider this: if you wish to exploit the power of your TRS-80 to its fullest and allow for future expansion, it's for you. LDOS is a disk-owner's dream come true.

Let me assure you that this is not a biased, paid-for evaluation of LDOS. Radio Shack has realized the need to offer a more sophisticated operating system and their choice was LDOS. I have been using this system for nearly two years and I find the options in a sophisticated operating system well worth the extra money.

There are many other DOSs out there that TRS-80 owners are perfectly satisfied with, and justifiably so. I have used just about every one of them and find they all are excellent in many respects. But for now, my own pride of possession speaks when I say:

I'm not a DOS lover, or a DOS lover's son. But I'll use LDOS 'til a better DOS comes.

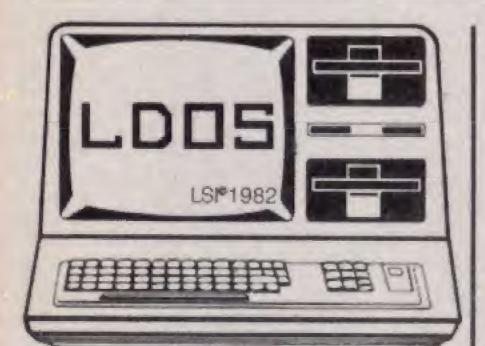


Volume 1 No. 1

SPECIAL EDITION



December 1, 1982



LDOS can't really turn your TRS-80 gold, but you'll think you've made the LDOS strike of the decade when you turn your micro on to LDOS. You'll find a bonanza of features like full keyboard type-ahead; a true background spooler, file backup by date, class, and between different drive types; hard disk support; data transportability between Model I and III; and a complete communications utility including disk file send and receive. Support for Radio Shack's Doubler and selected others is also provided. With our Job Control Language, you get true "hands off' running of your application programs - give a single command and then walk away. The 400 page manual includes examples of all commands and utilities. The Operator's Guide gives you step by step instructions on how to use LDOS with your applications. Stop running with only "half" a computer! Let LDOS provide the missing features to speed up and simplify your TRS-80 computer system! Visit a dealer or contact LSI for more information on the most popular sophisticated operating system for your TRS-80.

LDOS is available worldwide through thousands of dealers for just \$129.

The BASIC Answer

The BASIC Answer is a BASIC text processing utility. It is designed to allow the BASIC programmer to build code in a structured manner. "Source" code is written with a word processor or text editor which allows the user to exploit the powerful editing and movement features characteristic to those types of editors. Source code can even be created by your own BASIC interpreter. The BASIC Answer is then used to process these files into normal interpretive BASIC code.

Free Yourself from Line Numbers

The BASIC Answer allows substitution of labels for line numbers! This means that your BASIC code now can read like a novel. Instead of the typically undescriptive "GOSUB 1000", a label such as "GOSUB @ Search. Name" is used. Imagine yourself reading code filled with such descriptive branches and understanding it at a glance, even years later. This feature even allows totally relocatable BASIC routines without the renumbering problems.

TRS-80 is a trademark of Tandy
Corporation. LDOS is available for
the TRS-80 Model-I and Model-III.
Prices and specifications subject to
change without notice. LDOS and
The BASIC ANSWER are products of
Logical Systems, Inc.

ORLP!=2TOHA!PRINT@32,"primes found LP!=INT(HA!/LP!)THENGOTO48"C : IFVAL (FAS)=LO!THENFAS="* P :0%)=L0!on this scan"USING"## PS%=PS%+1ELSEFA%=LFFT%(FA% ORLP!=0T010PRINT@0,"factoring "US lINT@64*LP!+192.PR!(LO%).PR\$(LO%) FLO%=-11FVAL (IN\$)<2THEN11NG"###,# O%=CO%+INPUT" END OF SCAN": IN\$ (FCO%=11EN!=INT(VAL(IN\$))IMPR!(10) FHA!/LP!=INT(HA!/LP!)THENGOTO48 "C EXTLP!:IFVAL(FAS)=LO!THENFAS="* P !!(CO%)=LO! on this scan"USING"## R\$(CO%)=FA\$ LEN(FA\$)-1)FORLO!=ST! O%=CO%:PS%=PS%+1ELSEFA\$=LEFT\$(FA\$ ORLP!=ØT01@PRINT@Ø."factoring "US INT@64*LP!+192.PR!(LO%).PR\$(LO%) O%=LO%-INPUT"ORIGIN OF SCAN":INSØ FLO%=-1[FVAL(IN\$)<2THEN11NG"###,## EXTLP! ST!=INT(VAL(IN\$))##":PS%:B O%=CO%+INPUT" END OF SCAN"; INS (ORLP!=2TOHA!PRINT@32, "primes found FHA!/LP!=INT(HA!/LP!)THENGOTO48 "C

A New Concept in Variable Usage

The BASIC Answer allows variable names to be as long as 14 characters and ALL 14 are significant. Imagine reading:

"IF ACCNT.OVERDUE #>
0 THEN GOSUB
@PRINT.DUN"
rather than

"IFAO#>0THEN GOSUB52130"

Which would you rather read? It also introduces to BASIC the concept of Global and Local variables. This feature circumvents the tedious problem of variable tracking because a Local variable is only viable in its own subroutine!

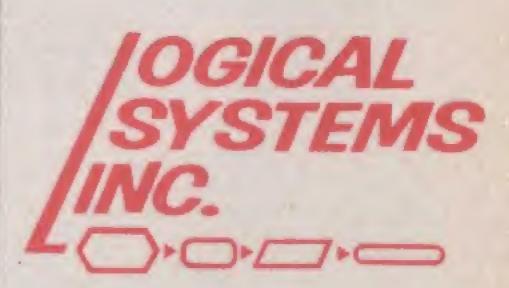
NOW AVAILABLE LDOS 5.1 Quick Reference Card \$5.95.

End the Multiple Machine Hassle

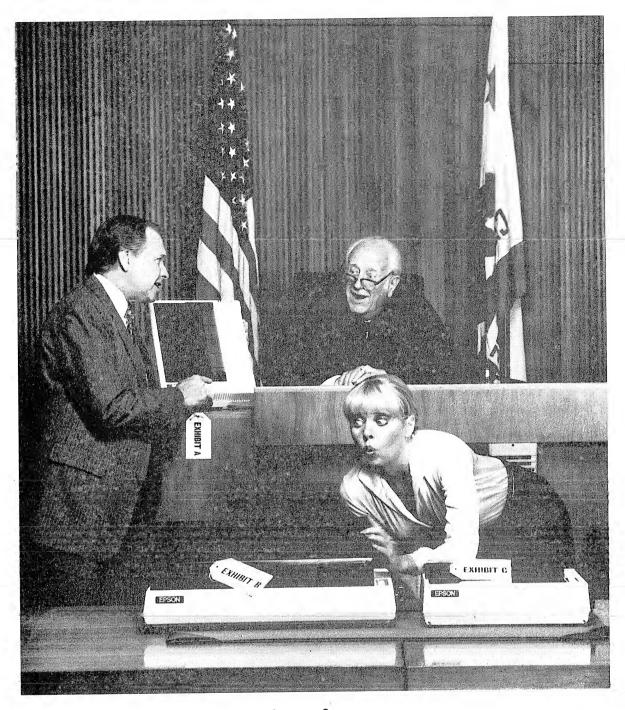
The BASIC Answer introduces the concept of "Conditional Translation." This feature allows the programmer to place different "machine dependent" code simultaneously into the same Source Code. The BASIC Answer can be "switched" when processing to ignore the unwanted or include extra code! No more multiple master programs to confuse maintenance. All the masters could now be rolled into the same program. Modify the one master and you've modified them all. Process the same code with different switches set, and get two or more versions from the same source.

The BASIC Answer combines the self-documenting power of COBOL with the relative ease of BASIC together with the power of a word processor.

The BASIC Answer is available for just \$69.00.



11520 N. Port Washington Rd. Mequon, WI 53092 (414) 241-3066



The facts.
And nothing but the facts.

Epson.

Our MX Series printers are the best-selling dot matrix printers in the entire world. This is why.

Fact One: We've got your type.

Epson invented correspondence quality printing. And we still do it better than anybody.

But more importantly, we do *more* of it than anybody. On every Epson MX printer, you get a choice of *sixty-six* different type styles, including italics, a handy subscript and superscript for scientific notation and small print, enough international symbols to print most Western languages, and one-pass underscore. All in a tack-sharp, easy-to-read 9x9 matrix with full descenders.

If print quality is important to you, your next printer is an Epson.

Fact Two: Ultra-high resolution graphics. There simply is no higher resolution graphics than GRAFTRAX-PLUS. And it comes standard on every MX.

You get bit image graphics free of wander, walk and jitter; graphics with blacker blacks and better definition because you can precisely place a dot at any of 25,920 positions inside a square inch (that's 120 DPI h x 216 DPI v); graphics that make our printers rival plotters.

If graphics is what you want, your next printer is an Epson.

Fact Three: Feature shock.

The Epson MX Series is packed with the features printer fanatics want most. A bidirectional print head with logical seeking of the shortest line. Programmable tab, form length and right margin. Top of forms recognition. Skip over perf. Software printer reset. True

backspace. Self test. The world's only disposable print head. And more. Lots more. On our MX-100 and MX-80 F/T, you even get both friction *and* tractor paper feed.

If you want performance, your next printer is an Epson.

Fact Four: Incredible reliability.

Epson MX Series printers are the most reliable printers ever made. And the reason is precision.

Take a look inside one and you'll understand. Notice the simplicity, the fit, the finish. That's why Epson has an out-of-box reliability rate others can only envy: 98%. And why our mean cycles between failures (MCBF) is over five million lines.

The whole package is neatly wrapped in a rugged plastic injection-molded case designed to look good — and stay looking good.

If you want a printer that works, and keeps on working, your next printer is an Epson.

Fact Five: World's best seller. Period.

Within months after we introduced the Epson MX-80, it was the best selling dot matrix printer in the world. It still is. Not because of anything we said, but because tens of thousands of computer enthusiasts went out and did some serious comparison shopping. They decided it was the best printer for the money they could buy. And who are we to argue?

If you want the world's best seller, your next printer is an Epson.

Fact Six: Quality doesn't cost more.

Don't take our word for it. Check it out. Look at what they give you. Then look at what we give you. Then look at the price.

There is only one logical choice. Epson. And that's the truth.

"In my judgment, this is the best printer you can buy."



Your next printer.

EPSON AMERICA, INC.
COMPUTER PRODUCTS DIVISION

3415 Kashiwa Street Torrance, California 90505 (213) 539-9140

Radio Shack hard disk system

A user's report

T. R. Dettmann, Associate editor

The Radio Shack Hard Disk System (RSHDS) is Radio Shack's entry into the hard disk market. With hard disk systems rapidly becoming more affordable, it was inevitable that the Radio Shack line should expand to include hard disk capability. This article discusses how the RSHDS works in an actual, working environment, with real day-to-day problems to solve.

This review is based on experience gained in helping several people install hard disk systems for their businesses. It is a description of how well the RSHDS worked in their situations. Each of the installations was a Model II-based system, officially installed by a Radio Shack Computer Center.

The Hard Disk

The hard disk itself is an 8.4 megabyte, two-disk, four-platter, eight-inch hard disk system, mounted in a sealed environment. For those who like numbers, the specifications for the system are: Rotation speed, 3125 rpm; latency, 9.6 ms; track access time, 19 ms (track to track); data transfer rate, 4.34 Mb/sec.

Backup is accomplished by the Hard Disk Operating System to eight-inch floppy disks, using a special utility called save. A restore utility is provided to regenerate the hard disk riles from the backup copies.

Experienced Model II owners will

find it easy to use, since it appears to the system as disk four. It is normally set up so that the system will start up with the hard disk in operation, taking the place of the drive zero diskette. In this way, your normal use of the diskette system is to transfer programs and do backups.

Once started, the hard disk operating system acts enough like TRSDOS 2.0 to be familiar to anyone who has operated a Model II. The hard disk system is actually TRSDOS 4 (.0 or .1, depending on which release you have).

All of the standard file handling commands are included with the system, as are some new commands. FLOPPY (on/off) turns floppy drives on or off. DRIVE controls drives on or offline (4.1 system). FCOPY is used to up-or download from floppy disks. I haven't personally verified that all commands work, but all that I've tried worked correctly.

One of the problems with TRSDOS 4 is incompatibility with TRSDOS 2.0. You can't just put a TRSDOS 2.0 disk in drive zero and have the hard disk operating system read it. Why, you ask? Well, TRSDOS 4.0 formats its disks differently so that they hold more information. That's great, but why can't the TRSDOS designers get the trick of recognizing a disk in some way (say a standard single density track zero) and make the transition auto-

matic? CP/M systems do it.

To correct the problem, FCOPY is provided. On the 4.0 system, it serves for uploading and downloading of files or whole disks. On the 4.1 system, you get some additional features, such as the ability to get directory listings of floppy disks.

As I noted above, there are two releases of the operating system software. One of the installations, working with a hard disk as of this writing, is still on TRSDOS 4.0. It works fine, but doesn't have some of the things TRSDOS 4.1 has, such as the drive command and the extended FCOPY.

In operation, I've helped to install several databases now using the RSHDS. The advantage of the hard disk is its speed compared to floppy disks. On one database, an increase of five to six times in search speed was noted in going from floppy disk to hard disk.

The RSHDS system is not without its difficulties, though. The FREE command is much harder to understand. It no longer has a picture of the disk layout, but is just a set of numbers. DIR takes a long time since it goes through quite a few files.

My biggest objection to the system is the fact that it allows no internal directory structure within the hard disk system. With as much space as there is on a single hard disk, placing all of the files in a single directory can sometimes make it im-

24 80-U.S. Journal

possibly large — far too large for most people to really handle effectively.

When we reviewed the CORVUS hard disk, the Model I NEWDOS system for the CORVUS provided a multiple directory structure, allowing the user to effectively attach parts of the disk as logical disks. The CORDOS system provided this same ability on the Model II.

This capability isn't just nice. For some people, it could be essential. One of the installations I've worked on has the complete COBOL accounting system from Radio Shack. Anyone who has seen these packages knows how many files there are in one of the packages — quite a few. Directories go a long time.

There are other problems as well. One of the companies installed the Radio Shack payroll system on the hard disk. After being told it was compatible, they found (or rather, I did) that the payroll program had written over the list command with a BASIC program also called LIST. The hard disk system stores its commands as separate programs. At least, in this case, it could be changed.

One of the companies has had a number of problems with data files being scrambled. So far, no cause has been found and Radio Shack is working on it. I can't say that the problem has anything to do with the hard disk, but to paraphrase an old say: "ya better keep yer backups dry."

So, who is the system really good for? The best applications I've seen on the RSHDS system are those where a few very large files are kept. One of the systems is maintaining a 5000-item Profile database with all of the files on the hard disk. It really works well.

My impression of the RSHDS system is primarily favorable. I would go out and buy one for myself, having seen it in operation. I've heard of some repair problems, but nothing I can verify. Based upon what is admittedly not a rigorous test, I wouldn't hesitate, at this point, to recommend a Radio Shack hard disk.

THE COMPUTING TEACHER

The Journal of The International Council for Computers in Education

Vol. 10 N					
		Features			
	4	Big Things Come in Small Packages Camille A Allen and Robert T Rude			
	5	Success Date Thurston			
	9	University of Oklahoma Hosts Programming Contests			
	14	"Messing About": Six Easy Steps for Getting Started with Computers Ann White Leu in			
	18	Trick Pluy: Picking NFL Winners at Random Ron Dirkse			
	20	Jefferson High School's Computer Program: A Curriculum Development Model for the Future Mary Bothwell			
	26	How Dnes a Speak & Speil Taik? Barbara Thompson			
	27	Substrings Cray Moore			
	30	An Argument for Including String Vuriables in Early Programming Activities M. J. Winter			
	31	Index for the PET Raymond F. Merratt			
		Preparing Slide Presentations on Computers John K. Elberfeld			
	38	The First und Perhaps Last Annual TCT Official Contest			
	43	The Holistic Approach to Introducing Computer Systems Harold W. Lawson, Jr.			
	50	Microcomputer Remedial Instruction Rita Gerzanick, Charles Lanoza, Richard D. Nolan			
	54	Minnesotu Statewide Computing Contests for Students & Teachers Tom Boo			
n, 1	59	Reactions of a High School Teucher to "Computer Power" Wilham F. Baird			
		Departments			
htor s Message tters to the Fo		41 Computing Problems			
hat s New	nter	64 Book Reviews 70 ICCI Organization Members			
omputer Litera		Reviews 74 Classified Ads			
omputers in Sci omputers in the	ience Ed	ucation 72 Organization Membership in ICCE pg 72 Index to Advertisers			

The Computing Teacher is a journal for educators who are making instructional use of computers or who are concerned with how computers are affecting the content and process of education. Each issue contains information of use to the beginner and to the experienced user of computers. Topics covered include teaching using computers, teaching about computers at all grade levels, use of computers as an aid to problem solving in all disciplines and teacher education.

The Computing Teacher is a publication of the International Council for Computers in Education, a non-profit corporation. ICCE has members from every state in the United States and every Canadian province, as well as from many different countries. ICCE is dedicated to helping teachers cope with computers in education and to improving education at all levels.

Subscription Rates

Non-U.S. (Surface Mail*
\$20.00 (U.S. Funds)
\$38.00 (U.S. Funds)
\$54.00 (U.S. Funds)

The Computing Teacher University of Oregon Eugene, Oregon 97403

13

Save \$2.50 handling charge by including payment with your order.

Announcing

ACCESS UNLIMITED'S





FREE! DOSPLUS 3.4**
disk operating system
with any Percom or
Access Unlimited Drive
for the Model III*

SAVE \$50.00 on fully-tested PERCOM Disk Drive for Model III* Reg. \$499.00. Now \$449.00

Percom's internally-mounted drives, with their widely-acclaimed disk controllers, are completely pre-tested with a 48 hour Burn-in. So, you know it works right when you get it. Choose single or double-density storage capacity.

A First-Drive System includes the four-drive disk controller, your choice of one or two drives, power supplies, cables and a fully-illustrated, easy-to-understand owner's manual.

Top-of-the-line Access Unlimited addons for the Model III* Disk Drive only \$334.00 Single, and \$628.00 Double.

Access Unlimited's drives for the Model III* bring you all the outstanding features of the Percom Drive, plus the superb, deluxe quality of the Access Unlimited workmanship that goes into the precision-made equipment which bears our name.

Make sure it's done right. Let us install your First-Drive System.

Purchase your Model III* Drives from us and for \$39.95 plus shipping, you can have our experienced professionals perform a 48-hour burn-in of your Model III* computer, install the drive system, and check out your expanded system to make sure everything works correctly. Call for pricing of complete Model III* system with 2 to 4 Access Unlimited or Percom drives.

Get the best! Our own fully-tested drives . for as low as \$275.00

Every Access Unlimited Floppy and Flippy Disk Drive is electrically and mechanically tested, then burned-in for 48 hours under operating conditions. The signed test list in your shipping carton is proof of that.

Our floppy disk drives offer you either single or double density. With double-density, it stores up to 364 Kbytes, depending on the format. And you can use both sides of the diskette on our flippy drives.

SATISFACTION GUARANTEED! If you're not completely satisfied with your Access Unlimited Disk Drive, return it within 15 days for a full refund. All our drives have a comprehensive 90-day limited warranty.

For a limited time only, you can get top-quality namebrand disk drives at rock-bottom prices.

- Sale ends Feb. 28, 1983 -

(But some prices will be good after Sale ends. Please call 1-800-527-3475 for pricing.)

Save \$\$ on our most popular items!

Percom Data Separator (reg. \$29.95)	now \$23.95
Screens for Models I*, II*, III Green, Lt. Blue, Dark blue,	400
and Amber. Bronze for color video (reg. \$24.95)	now \$14.95
Head Cleaning Kit (reg. \$29.95)	now \$19.95
Drive Numbering Tabs, pkg. 0-3 (reg. \$4.50)	now \$3.95
Flip-N-File 51/4 " (reg. \$39.95)	now \$24.95
Flip-N-File 8" (reg. \$54.95)	now \$39.95

AFD 100-40-track single-density drives \$275.00

JUST PURCHASED! Overstock of Japanese-manufactured absolutely top quality CP/MX based business computers. From 160 KB to 40 + MB.

We have just added approximately \$100,000.00 worth of brand new business and game software.

Call or write for our new FREE catalog.



Electric Crayon™ Close-out—only 80 left. When these are sold, there will be no more! reg. \$289.00 now \$149.95

Use the electric crayon with your own monitor or color TV set. Use it with your Model I or III TRS-80™ and a color monitor or color TV set for a very low cost, high quality color computer. (Hook up instructions furnished.)

XTRA Special—Soft sector diskettes—Carload purchase—As low as \$19.90 for box of 10

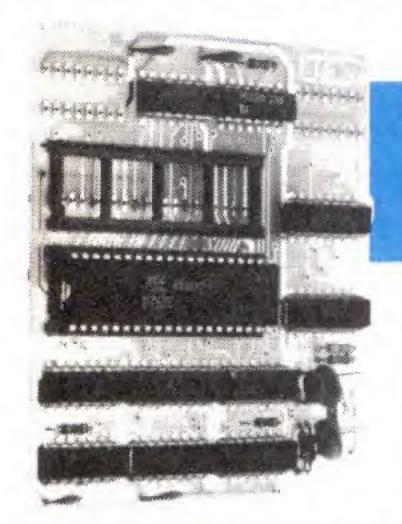


SSSD, with hub, 51/4"
SSDD, with hub, 51/4"
DSSD, with hub, 51/4"
DSDD, with hub, 51/4"
SSSD, 8"
SSSD, 8"
SSSD, 8", high performance
DSDD 8"

One year limited warranty against manufacturing defects

\$19.90 box of 10 22.80 box of 10 29.90 box of 10 33.50 box of 10 22.75 box of 10 22.90 box of 10 31.95 box of 10

CHRISTMAS SALE!



SAVE \$\$ 3 WAYS! now \$184.95!

Upgrade your Model I* to **Double Density**

Percom's proven Doubler II™ with DOSPLUS 3.4** and Move 1-2-3 software —a \$339.95 value, now \$184.95!

The completely assembled and fully-tested Percom DOUBLER II™ is ready to go to work when you get it. All you have to do is plug it in. It can store over 4 times more on one side of a diskette than a standard Tandy Model 1* drive. It reads, writes, and formats either single or double-density. Comes with a DOSPLUS 3.4** disk-operation system. Runs TRSDOS*, NEWDOS** Percom OS-80™, and other single-density software. (You can change to double-density at any time.) Uses Move 1-2-3 utility (\$29.95) or other appropriate software to read Model III* programs on your Model I*. Has on-card high performance data separation and write precompensation circuitry. Doubler IITM

DOSPLUS 3.4D**	150.00
Move 1-2-3	29.95
Total Value	\$339.95
Now only You SAVE	\$184.95 \$155.00
1 4 41 47 1 1	



From \$1,995 (5 MB)

Check out the benefits of Access Unlimited Hard Disk Drives

can be used for Model II*, Model III* computers. 5, 10 Megabyte and larger drive units.

lets controller handle up to 4 drives.

works along with existing floppy disk drives.

includes host system support software. 15-day FREE trial period.

SAVE on an Arrick Quick Switch‡

Changes a TRS-80* printer port or a peripheral between computers instantly and easily. Available for RS-232 and Centronics. Plugs included. Now from \$99.95. Cables from \$31.95.

LAST MINUTE CLOSE-OUT

TFD 100 40 track floppy disk drives - only 200 left reg. 439.00 - now 278.90 or 2 for \$540.00.

Enjoy 1-stop shopping and BIG savings

Order your disks, software, supplies, and accessories from Access Unlimited. We offer low prices on automatic Datamarc*** Sheet and Envelope Feeders for Radio Shack*, QUME, Ricoh, Diablo Daisywheel, and Dot Matrix Printers. And the more you buy at one time, the more you can save.

For more information, call (214) 340-5366 Monday through Friday; (214) 690-0207 after 5 p.m. and Saturdays.

To order or for FREE literature, call TOLL-FREE



V/SA 1-800-527-3475 (master charge)



Ordering Information

Order by phone or by mail. We accept Visa, MasterCard, cashier's checks, certified checks, and money orders. With personal checks, allow additional time for bank clearance. Your bankcard will not be charged until your order is shipped. On orders over \$1,000, we pay freight (surface only) and insurance; please add \$3.00 shipping and handling under 50 lbs. Over 50 lbs., add \$5.00 for orders under \$1,000.00. Texas residents add 5% sales tax. Allow 2 to 4 weeks for delivery.

Trademark of Tandy Radio Shack Corp. †† Trademark of Apparat Corporation OF SYMBOLS TM Trademark of Access Unlimited

- ** Trademark of Micro-Systems Software, Inc.
- ‡ Trademark of Arrick Products Company ***Trademark of Datamarc, Inc. † Trademark of Percom Data Company, Inc. x Trademark of Digital Research

Name			
Company Name			
Address			
City		State 7	Zip
Phone Number ()		*
Quantity	Item	Unit Price	Subtotal
			J.
		Subtotal	
	State Sales Tax (Texas residents only)	
		handling charge	ŧ
Check one:		Total	
payment enclose	ed 🗆 Visa 🛭	☐ MasterCard*	
*If MasterCard, nur	nbers above nam	ne:	
	\Box		
Expiration Date: L			

ACCESS UNLIMATED

DEPT. AX 401 N. Central Expy.

and the same of th

Richardson, Texas 75080

Grab TRSDOS by the horns

Run a data disk in drive zero

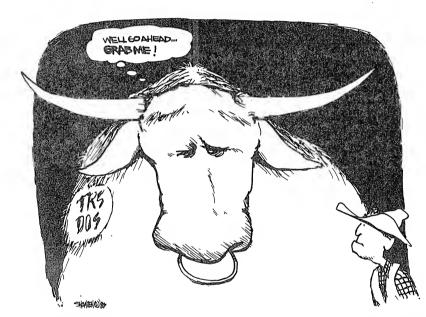
Model I, PMC-80, LNW80

Michael D. Andreas and Charles P. Knight, Arlington, TX

TRSDOS and other compatible operating systems consist of huge amounts of code. Hence, they require a large part of the disk in drive zero. To avoid having all of the system in memory at the same time, as is done on the Apple, TRSDOS loads in portions of its code from disk as it needs it. This is why the operating system on the TRS-80 is so much more powerful than that of the Apple — it saves memory space and allows a much more sophisticated operating system to be written, but it does so at the expense of disk space. It also requires that the disk in drive zero contain these overlays at all times, if maximum use is to be made of the system. These portions of code are called "system overlays" and load into the same memory space, but at different times. The memory area used by these overlays is usually 4E00H to 51FFH.

With memory prices dropping, everyone should have 48K of memory. Yet, many applications have been written that only require 32K of memory or less. If you can tie your shoes without help, you can install memory into the TRS-80 expansion interface. So, what are you waiting for?

We propose to put this extra memory to good use by placing system overlay files into the upper 16K of memory. This will speed operations and reduce wear and tear on the disk and drive. You may have noticed that when a new file is being written on a drive other than the system drive, occasional accesses are still done to the system disk. That is because different overlay



files are being loaded.

TRSDOS has five overlays, SYS1/SYS through SYS5/SYS, which use this area, and an additional overlay, SYS6, which uses memory at 5200H. SYS0/SYS is not an overlay — it is the resident system. It is loaded into the area between 4000H and 4E00H by BOOT/SYS each time you boot and is not accessed on the disk again until vou reboot.

It is the goal of the boot operation to get SYS0 into memory. Once SYS0 is there, it does not need to be on any disk in the system. It must be present on the disk used for booting, or you'll be greeted with that annoying "NO SYSTEM" message. BOOT/SYS must remain on the disk in order for the system to find the directory track should the system lose it.

SYS1 is loaded on entering DOS

and on returning to DOS READY from any of the other system overlays, or from BASIC, or any other command file. It contains code necessary to accept user input and call the correct overlay from among the other system files. It is also responsible for displaying the DOS READY prompt.

SYS2 and SYS3 are used in opening and closing files. Each time a request is made of the operating system that involves opening or closing a file, or saving or loading a BASIC or machine language program, these two files are called, one at a time, to provide the code to do this. Even a BASIC program is a file, and before that file can be loaded, it must be opened. After loading, it must be properly closed.

Since these files must be read in from disk each time they are used, a great savings in time can be

28 80-U.S. Journal

BOOST THE POWER AND PERFORMANCE OF YOUR TRS-80TM WITH WILEY'S FRIENDLY PAPERBACK GUIDES

THE TRS-80™ MODEL III USER'S GUIDE

Tony Bove & LeRoy Finkel

Get to know the myriad of applications, options, and accessories available for the TRS-80TM Model III—with the help of this clear, nontechnical guide. It explains everything you need to know to use your micro effectively—from handling its disk operating system to coming to grips with the incredible array of software on the market.

(1-86242-8) November 1982 approx. 256 pp. \$12.95

THE GENIE IN THE COMPUTER

Easy BASIC Through Graphics TRS-80™ Edition

Rachel Kohl, Laura Karp, & Ethan Signer

Learn how to program the fun and easy way—by interacting with the "genie", a microcomputer graphic. A tiny core program on the very first page of the book shows you how to bring the genie to life—a simple face on the monitor screen of your TRS-80™ As you master each new programming concept, you can make the genie move, smile, talk, tell stories, and even star in a movie. Ideal for young people and for adults with "technophobia."

(1-87049-8) October 1982 approx. 320 pp. \$12.95

FAST BASIC

Bevond TRS-80™ BASIC

George Gratzer with Thomas Gratzer

Now you can combine TRS-80™ BASIC with assembly language to dramatically increase the execution speed of your programs from 4 to as much as 1,000 times. This practical guide teaches you 20 Assembly Language Instructions and the names of 60 ROM routines, then shows you how to apply these concepts to your knowledge of BASIC. Also includes valuable information on the operating principles of the TRS-80.™

(1-09849-3) 1982 278 pp. \$14.95

Convenience software (contains all the teaching and utility programs listed in FAST BASIC)

Model I Disk: (1-87484-1) 51/4" disk; 32K of memory \$19.95

Model III Disk: (1-86838-8) 51/4" disk; 32K of memory

Cassette for Model I or Model III: (1-87421-3) 16K of memory \$19.95

TRS-80™ is a trademark of Tandy Corp.

1807 (1982

JOHN WILEY & SONS, Inc.

605 Third Avenue, New York, N.Y. 10158

In Canada: 22 Worcester Road, Rexdale, Ontario M9W 1L1

3-8617

SUBROUTINE SANDWICH

John P. Grillo & J. D. Robertson

Here, in one easy-to-use manual, are 36 BASIC subroutines—powerful modules that you can combine and build onto to write structured programs that are clearer, easier to modify, and require less composition and debugging time than traditional programs. Geared for use with the TRS-80TM Model I or Model III, the book is carefully structured, with each subroutine a separate four-page unit. You'll find crystal-clear explanations of how each subroutine works, possible applications, suggestions for modifying it, and a program that incorporates it, complete with sample output. Five mother programs demonstrate the real-world applications of this practical programming technique.

(1-86920-1) January 1983 approx. 224 pp. \$12.95

For 36 additional subroutines in the same user-friendly format, turn to

MORE SUBROUTINE SANDWICH

John P. Grillo & J. D. Robertson (1-86921-X) January 1983 approx. 224 pp. \$12.95

SUCCESSFUL SOFTWARE FOR SMALL COMPUTERS Graham Beech

This easy-to-use manual shows you how to write dependable, efficient, even elegant programs that work the first time—even if you're just a novice programmer. First you'll master the principles of successful software design with the aid of a PDL (program description language). Then you'll learn how to create reliable, structured programs that are easily—almost automatically convertible to Microsoft BASIC. Applications range from data structures, files, and sorting to simulations, mathematical equations and computations, and more.

(1-87458-2) November 1982 approx. 192 pp. \$12.95

paperback guides to help you get the most use and enjoyment from your TRS-80. Look for them all at your favorite bookshop or computer store.

Wiley publishes more than a dozen popular,

OMNITERM

The ULTIMATE TRS-80 Terminal Package

What is OMNITERM?

OMNITERM is a professional communications package for the TRS-80 that allows you to easily communicate and transfer files or programs with almost any other computer. We've never found a computer that OMNITERM can't work with. It's a complete package because it includes not only the terminal program itself, but also conversion utilities, a text editor, special configuration files, serious documentation and serious support.

Why do I need it?

You need OMNITERM if you need to communicate efficiently with many different computers, or if you want to customize your TRS-80 for use with one particular computer. You need OMNITERM to SOLVE your communications problems once and for all.

What do I get?

The OMNITERM package includes the OMNITERM terminal program, four conversion utilities, a text editor, and setting files for use with popular computers such as CompuServe, the Source, and Dow Jones — just as samples of what you can do for the computer you want to work with. The package includes six programs, seven data files, and real documentation: a 76-page manual that has been called "the best in the industry." And OMNITERM comes with real user support. We can be reached via CompuServe, Source, phone, or mail to promptly answer your questions about using OMNITERM.

What do I need to use OMNITERM?

A Model I or Model III TRS-80, at least 32K of memory, one disk, and the RS-232 interface, or Microconnection modem. OMNITERM works with all ROMs and DOSes, and will work with your special keyboard drivers.

What will it do?

OMNITERM allows you to translate any character going to any device: printer, screen, disk, keyboard, or communications line, giving you complete control and allowing you to redefine the character sets of all devices. It will let you transfer data, and run your printer while connected for a record of everything that happens. OMNITERM can reformat your screen so that 80 32, or 40 column lines are easy to read and look neat on your TRS-80 screen. It even lets you get on remote computers with just one keystroke! The program lets you send special characters, echo characters, count UART errors, configure your UART, send True Breaks and use lower case. It accepts VIDEOTEX codes, giving you full cursor control. It will even let you review text that has scrolled off the screen! Best of all, OMNI-TERM will save a special file with all your changes so you can quickly use OMNITERM for any one of many different computers by loading the proper file. It's easy to use since it's menu driven, and gives you a full status display so you can examine and change everything.

"OMNITERM has my vote as the top TRS-80 terminal program available today" Kilobaud Microcomputing, June 1981, pages 16-19.

OMNITERM is \$95 (plus shipping if COD) Call for 24 hour shipment. Manual alone \$15, applied toward complete package. Visa, M/C, and COD accepted. MA residents add 5% tax. Dealer inquiries invited.

Also available OMNITERM for the TRS-80 Model II and IBM personal computer. Contact Lindbergh Systems for details.

indbergh Systems

41 Fairhill Road, Holden, MA 01520 (617) 852-0233 # 16

Source: TCA818 CompuServe: 70310,267

TRS-80 is a ™ of Tandy Corp

Grab TRSDOS

realized, in a program which repeatedly opens and closes files, by having these two modules already resident in memory. Instead of reading the disk, a simple block move is done to relocate the code to the proper place in RAM. It is possible to speed things up by as much as one thousand percent this way, but it will cost you some of your high memory.

SYS4 displays DOS error messages. Actually, SYS4 isn't really an executable code. It's just a table of error messages that is accessed by SYS0 each time an error has occurred. The entire file is read into the overlay area and the proper error message is displayed. If you never make errors (you are perfect, aren't you?), then SYS4 is never used.

SYS5 is the system debugger. If you never program in machine language, then you don't need this overlay and can gain an extra gran of disk space by killing it. Many new TRS-80 users have been surprised to see the screen fill with baffling numbers when the computer should have been doing something else. This is the debug screen. To a programmer, it is very useful, but to a non-programmer, it can be quite a surprise. This program requires it to be on the disk and it will be placed in high memory with the rest of the system overlays. A flag is maintained, in the system communications area, to tell the system whether debug is active or not. If debug is active and the break key is pressed, or a /CMD file is executed, it is loaded from disk and executed. SYS1 is reloaded whenever debug is exited via the normal G402D command.

SYS6/SYS occupies an area above 5200H and is used to execute DOS library functions. Any time you enter a command which is in the TRSDOS command library, code in SYS6 is executed to perform the function requested. To get a look at the commands that use the SYS6 overlay, type "LIB" in response to DOS READY. The command "LIB", itself, is also executed by this overlay.

Since a directory access is required to load the overlays, the

files are physically located next to the directory track on the disk to minimize access time. You can see that, by placing them in unused memory, even more time would be saved by not having to access the disk at all.

DOS loads the system files, as needed, by an unusual (but logical) process. When you call a vector (documented in the DOS manual) that is in one of the overlays, the A register is loaded with a value that corresponds to the desired function. The lower four bits specify the desired overlay file. The most significant bit must be set to signify that this is a call for an overlay, and the remaining three bits specify the subfunction in the overlay.

Next, an RST 28H instruction is executed. This is the same as CALL 28H, except it is only a one-byte instruction whereas, a call would be a three-byte instruction. The ROM code at 28H vectors to 400CH, which vectors to the system overlay loader. This routine kills the return address, so that control will pass back to the program which called the documented vector. Then, it ensures that bit 7, in the A register, is set. Next, it looks at the lower four bits and compares that value with a variable that specifies which overlay is already in memory. If it's already there, control is passed directly to it, otherwise it is loaded

The value of the lower four bits is the directory entry code (DEC) and corresponds to the location of the entry for the /SYS file in the directory. This explains why you can't directly copy a /SYS file to a disk that doesn't already have it in the directory. If you try, the directory entry will be randomly placed in the directory and will most likely be put in a different directory slot. The system overlay loader would go crazy trying to find it.

Our program, which we call MEMSYS/CMD, copies each SYS file into memory, then modifies the system overlay loader to look first in memory for the file before going to disk. Files are stored in memory (in the load module format) as on disk, which means that any patches you have applied will be loaded

automatically with the /SYS file.

Type in the accompanying program under EDTASM. If you desire a different set of files in memory, delete the code that points to the filename, calls the loader and checks for an error. The last error check done must be the same as the one after the code that loads SYS6.

We also strongly recommend that you make a special disk to transfer your object code to while testing the program. Since we're playing around with the system, a simple typographical error could cause portions of the disk to be overwritten with garbage. This happened during the development of this program, exercising our vocabulary considerably! Previous tangles with machine language program bugs have taught us to be careful.

One note about the password, ".L0Y4". This seems to be a master password that allows access to any protected file under TRSDOS 2.3. Now that you know this password, you can enjoy looking at files Tandy thought you shouldn't see.

This program is compatible with any application that recognizes and respects the top of memory value which DOS stores at 4049 and 404AH (also referred to as HIGH\$). BASIC uses this value as the default answer to the "MEMORY SIZE?" initialization question. (NEWDOS 2.1 BASIC does not honor HIGH\$.) All of the TRSDOS 2.3 overlays will fit into less than 11K of memory, so any BASIC program that works in a 32K machine will certainly work with MEMSYS active in a 48K machine.

With MEMSYS active, you should notice a vast improvement in operating speed involving opens, closes and file writes, which extend the length of the file. Saving a file from BASIC will only access the drive that the file is being saved to. Typing CMD"S" will reenter DOS without reading SYS1/SYS from the disk. Entering debug is done without starting the disk. Exiting debug via G402D does not activate them either. The clock will lose less time because fewer sectors are being read from disk.

Perhaps the largest advantage of

MEMSYS is the ability to use a data disk in drive zero. This amounts to an extra eleven granules of storage space. Simply boot up with a system disk, activate MEMSYS, load BASIC and your program, and swap in a data disk. Of course, you will have to reinsert the system disk if you want to reboot. This will be a definite advantage for short programs that handle a large amount of data. Two-drive owners will find that they can copy files from one data disk to another without copying them to a system disk first.

The program listing shown is for

TRSDOS. Modifications for NEWDOS 2.1, and another for DBLDOS, are shown as additional lines of code to be added after the TRSDOS code has been entered. Use the same line numbers we have, and you can add the code for the operating system of your choice later with minimum difficulty. Where a line number exists that is not in the TRSDOS version, add that line. Where a line number is the same as in the TRSDOS version, substitute that line for the one in the TRSDOS version.

When MEMSYS is first executed, it must create an area in memory to

Listing 1

```
00100 .*********
              00110 ;**** MEMSYS 1.0
              Ø0120 ;***** FOR TRSDOS 2.3
                                                  ********
              ØØ130 ;***** COPYRIGHT 1981
                                                  *****
              00140 ;**** BY MICHAEL D. ANDREAS *********
                    ØØ145
              ØØ15Ø
              ØØ16Ø
                      MEMSYS WILL PLACE SYSTEM OVERLAYS
              ØØ17Ø
                      SYS1/SYS THRU SYS6/SYS INTO THE LIPPER
              ØØ18Ø
                       MEMORY OF A 48K MACHINE AND THEN MODIFY
              ØØ19Ø
                       THE SYSTEM OVERLAY LOADER TO LOAD OVERLAYS
              ดนวดด
                      AS NEEDED FROM MEMORY INSTEAD OF WEARING
                       OUT THE DISK AND DRIVE. (IT'S A LOT
              ผด21a
              ØØ22Ø
                      FASTER TOOLLIL
              ØØ23Ø
5200
              00240
                             ORG
                                     5200H
5200 110072
              00250 INITSY
                            LD
                                     DE. SGNMSG
52Ø3 CD6Ø53
              ØØ26Ø
                             CALL
                                     DISPLA
5206 2180FF
              ØØ262
                             LD
                                     HL, SYlVAR
52Ø9 Ø68Ø
              00264
                                     B,128
52ØB 36ØØ
              ØØ266 L3
                             LD
                                     (HL),Ø
520D 23
              00268
                             INC
                                     HL
520E 10FB
              00269
                             DJNZ
521Ø 11RD52
              aa27a
                             LD
                                     DE, SYS1
                                               POINT TO FILENAME
5213 CDED52
              ØØ28Ø
                            CALL
                                     TUKSYS
                                               : PUT IT IN MEMORY
5216 2028
              ØØ29Ø
                             JR
                                     NZ, ERREXT
5218 11AD52
              ØØ3ØØ
                            LD
                                     DE.SYS2
                                               ; SAME-O SAME-O
521B CDED52
              00310
                             CALL
                                     TUKSYS
521E 2Ø2Ø
              ØØ32Ø
                            JR
                                     NZ.ERREXT
5220 119052
              ØØ33Ø
                                     DE, SYS3
5223 CDED52
              ØØ34Ø
                            CALL
                                     TUKSYS
5226 2018
              ØØ35Ø
                            JR
                                     NZ, ERREXT
5228 118D52
              ØØ36Ø
                            LD
                                     DE,SYS4
522B CDED52
              ØØ37Ø
                            CALL
                                     TUKSYS
522E 2Ø1Ø
              ØØ38Ø
                            JR
                                     NZ, ERREXT
523Ø 117D52
              ØØ39Ø
                            LD
                                     DE.SYS5
5233 CDED52
              ØØ4ØØ
                            CALL
                                     TUKSYS
5236 2008
              00410
                            JR
                                     NZ. ERREXT
5238 116D52
              ØØ42Ø
                            LD
                                     DE.SYS6
523B CDED52
              00430
                            CALL
                                     TUKSYS
523E 28Ø3
              ØØ44Ø
                            JR
                                     Z.NEREXT
524Ø C3Ø944
              ØØ45Ø ERREXT
                                     44Ø9H
              ØØ46Ø
                    THE NEXT SECTION OF CODE WILL BE EXECUTED
              ØØ4'7Ø
                    ; ONCE THE ENTIRE SYSTEM HAS BEEN SUCCESSFULLY
                    ; PLACED IN MEMORY. IT WILL MODIFY THE SYSTEM
              ØØ48Ø
              ผส49ส
                    ;OVERLAY LOADER TO LOOK INTO RAM FOR THE DESIRED
              ØØ5ØØ
                    ; SYSTEM. THE ORIGINAL CODE IS MOVED INTO HIGH
              00510 ; RAM FOR USE IF THE REQUIRED SYS OVERLAY IS
              พีฬ52ฬ
                    ; NOT IN MEMORY (IT WILL LOOK ON THE DISK).
5243 215DFF
              ØØ53Ø NEREXT
                            T.D
                                     HL, PATCH
                                               ; POINT TO NEW CODE.
5246 11CE4B
              ØØ54Ø
                            LD
                                    DE.OLDSYS
                                               ; POINT TO WHERE ORIGINAL CODE GOES
5249 Ø61D
              ØØ55Ø
                                     B,PEND-PATCH+1 ; NUMBER OF BYTES TO MOVE
                            LD
524B 4E
              00560 SWAP
                            LD
                                    C, (HL)
524C 1A
              ØØ57Ø
                            LD
                                     A, (DE)
524D 77
              9958U
                            LD
                                     (HL),A
524E 79
              WØ59Ø
                            LD
524F 12
              ØØ6ØØ
                                     (DE),A
```

be used as a mini-directory which MEMSYS will use to find the overlay when it is placed in memory. It proceeds to load each system overlay, in turn into memory, by pointing to a file control block (FCB), then calling the subroutine TUKSYS, which reads the file in and places it in high memory. If all designated system overlays are successfully loaded, it modifies the system loader and the top of available memory pointer, and returns to DOS. If it encounters an error at any point, it will abort and not modify the system.

The subroutine TUKSYS (which loads the /SYS file specified by the DE register pair) displays the filename, for the user's edification, then finds the mini-directory location specified by the byte pair following the terminating 00 byte after the filename in the FCB. In the NEWDOS 2.1 version, this must be two bytes of zeroes, for /SYS files with numbers less than ten, to keep the offset consistent. Throughout the loading of the /SYS file, the IX register pair will point to the beginning of the DOS FCB, and the IY register pair will point to the mini-directory entry. The /SYS file is opened, and the DEC is read from the eighth byte of the DOS FCB. This DEC is placed in the minidirectory entry for use when loading system overlays from high memory. Next, the ending record number (ERN) is obtained from the thirteenth byte of the FCB and placed in the second byte of the minidirectory. We can take this shortcut because /SYS files are never longer than 256 sectors long, so only one byte will be needed to store the ERN.

The value at memory location HLDARE specifies the top of available memory and the beginning of the memory location of this /SYSfile. This value is placed in the mini-directory and will be used by the modified system overlay loader to find the file. The FCB is positioned to the first sector which is read into memory. A period is displayed if it is successfully read. If the last sector has not yet been read, the routine loops back for the next sector. When the last sector has been read, it returns to the routine which

525Ø 23	ØØ61Ø		TNIC	T.TF	
			INC	HL DE	
5251 13	ØØ62Ø		INC	DE	
5252 10F7	ØØ63Ø		DJNZ	SWAP	copy pop land
5254 3EC9	00640		TD	A,ØC9H	CODE FOR 'RET'
5256 77	ØØ65Ø		ΤD	(HL),A	; PUT ON END OF OLDSYS
5257 216ØFF	00660		TD	HL, PATCH+3	ONE OF THE ORGSYS
525A 36CØ	00670		LD	(HL),ØCØH	; INSTRUCTIONS HAS TO BE
525C 23	00680		INC	HL (==) G	;MODIFIED
525D 36ØØ	00690		LD	(HL),Ø	; CODE FOR 'NOP'
525F 23	00700		INC	HL (com	
5260 3600	00710		LD	(HL),Ø	
5262 2A7EFF	00720		LD	HL, (HLDARE)	; PROTECT MEMORY
5265 2B	00730		DEC	HL	
5266 224940	00740		LD	(4049H),HL	; FROM SYSTEM.
5269 AF	00750		XOR	A	
526A C32D4Ø	ØØ76Ø		JP	4Ø2DH	; BACK TO DOS.
					IBES THE FILES TO
				EMORY AND WHERE A	
		;DIRECTO	DRY ENTR	Y WILL BE PLACED	•
	ØØ8ØØ				
526D 53	ØØ81Ø	SYS6	DEFM	'SYS6/SYS.LØY4'	; FILENAME
527A ØØ	ØØ82Ø		DEFB	Ø	TERMINATOR BYTE FOR PRINTOUT
527B 94FF	ØØ83Ø		DEFW	ØFF94H	MEMSYS DIR ADDRESS
527D 53	ØØ84Ø	SYS5	DEFM	'SYS5/SYS.LØY4'	
528A ØØ	ØØ85Ø		DEFB	Ø	
528B 9ØFF	ØØ86Ø		DEFW	ØFF9ØH	
528D 53	ØØ87Ø	SVS4	DEFM	'SYS4/SYS.LØY4'	
529A ØØ	ØØ88Ø	010.	DEFB	Ø	
529B 8CFF	ØØ89Ø		DEFW	ØFF8CH	
		ava 2			
529D 53	00900	5153	DEFM	'SYS3/SYS.LØY4'	
52AA ØØ	00910		DEFB	0	
52AB 88FF	00920		DEFW	ØFF88H	
52AD 53	00930	SYS2	DEFM	'SYS2/SYS.LØY4'	
52BA ØØ	ØØ94Ø		DEFB	Ø	i
52BB 84FF	ØØ95Ø		DEFW	ØFF84H	
52BD 53	ØØ96Ø	SYS1	DEFM	'SYS1/SYS.LØY4'	
52CA 00	ØØ97Ø		DEFB	Ø	
52CB 8ØFF	ØØ98Ø		DEFW	ØFF8ØH	
ØØ2Ø	ØØ99Ø		DEFS	32	
	01000				
		THE NE	CT SECTI	ON OF CODE TAKES	THE FILE POINTED TO
				STER AND PLACES	
	01030	, 111 11113	DL IUXI	DIEN AND PERCED .	II IN PEROICE
52ED D5		TUKSYS	PUSH	DE	
52EE DDE1		101015			
	01050		POP	IX	
52FØ D5	01060		PUSH	DE	
52F1 114772			* *		
FORM ORGAN	01070		LD	DE, LINE1	
52F4 CD6Ø53	Ø1Ø8Ø		CALL	DE,LINE1 DISPLA	
52F7 D1	Ø1Ø8Ø Ø1Ø9Ø		CALL POP	DE, LINE1	; RESTORE FILENAME
	Ø1Ø8Ø		CALL	DE,LINE1 DISPLA	; RESTORE FILENAME
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ	Ø1Ø8Ø Ø1Ø9Ø Ø11ØØ Ø111Ø		CALL POP	DE,LINE1 DISPLA DE	; RESTORE FILENAME ; FIND DIR POS
52F7 D1 52F8 CD6Ø53	Ø1Ø8Ø Ø1Ø9Ø Ø11ØØ		CALL POP CALL	DE,LINE1 DISPLA DE DISPLA	
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ	Ø1Ø8Ø Ø1Ø9Ø Ø11ØØ Ø111Ø		CALL POP CALL LD	DE,LINE1 DISPLA DE DISPLA HL,OFFSET	
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19	01080 01090 01100 01110 01120		CALL POP CALL LD ADD	DE, I.INE1 DISPLA DE DISPLA HL, OFFSET HL, DE	
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E	01080 01090 01100 01110 01120 01130		CALL POP CALL LD ADD LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HLL, DE A, (HL) HL	
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E 53ØØ 23	Ø1Ø8Ø Ø1Ø9Ø Ø11ØØ Ø111Ø Ø112Ø Ø113Ø Ø114Ø		CALL POP CALL LD ADD LD INC	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL)	
52F7 D1 52F8 CD6053 52FB 210E00 52FE 19 52FF 7E 5300 23 5301 66	Ø1Ø8Ø Ø1Ø9Ø Ø11ØØ Ø111Ø Ø112Ø Ø113Ø Ø114Ø		CALL POP CALL LD ADD LD INC LD LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A	;FIND DIR POS
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5	Ø1Ø8Ø Ø1Ø9Ø Ø11ØØ Ø111Ø Ø112Ø Ø113Ø Ø114Ø Ø115Ø Ø116Ø		CALL POP CALL LD ADD LD INC LD LD LD LD PUSH	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A	
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1	Ø1Ø8Ø Ø1Ø9Ø Ø11ØØ Ø111Ø Ø112Ø Ø113Ø Ø114Ø Ø115Ø Ø116Ø Ø117Ø Ø118Ø		CALL POP CALL LD ADD LD INC LD LD LD LD PUSH POP	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY	;FIND DIR POS
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø	Ø1Ø8Ø Ø1Ø9Ø Ø11ØØ Ø111Ø Ø112Ø Ø113Ø Ø114Ø Ø115Ø Ø116Ø Ø117Ø Ø118Ø		CALL POP CALL LD ADD LD INC LD LD LD PUSH POP LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER	;FIND DIR POS
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53Ø9 Ø6ØØ	01080 01090 01100 01110 01120 01130 01140 01150 01160 01170 01180 01190		CALL POP CALL LD ADD LD INC LD LD D PUSH POP LD LD LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø	;FIND DIR POS ;HL POINTS TO DIR POS
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53Ø9 Ø6ØØ 53ØB CD2444	01080 01090 01100 01110 01120 01130 01140 01150 01160 01170 01180 01190 01200		CALL POP CALL LD ADD INC LD LD LD PUSH POP LD LD LD CALL	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B, Ø OPENEX	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53Ø9 Ø6ØØ 53ØB CD2444 53ØE CØ	01080 01090 01100 01110 01120 01130 01140 01150 01160 01170 01180 01200 01210		CALL POP CALL LD ADD LD INC LD LD PUSH POP LD LD LD LD RET	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 530B CD2444 530E CØ 530F DD7E07	01080 01090 01100 01110 01120 01130 01140 01150 01160 01170 01180 01200 01210 01220 01230		CALL POP CALL LD ADD LD INC LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7)	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CD 530F DD7E07 5312 FD7700	01080 01090 01100 01110 01120 01130 01140 01150 01160 01170 01180 01200 01200 01230 01240		CALL POP CALL LD ADD LD INC LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC
52F7 D1 52F8 CD6Ø53 52F8 21ØEØØ 52FF 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53Ø9 Ø6ØØ 53ØB CD2444 53ØE CØ 53ØF DD7EØ7 5312 FD77ØØ 5315 DD7EØC	01080 01090 01100 01110 01120 01130 01140 01150 01160 01170 01200 01210 01220 01230 01240 01250		CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12)	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FE 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53Ø9 Ø6ØØ 53ØB CD2444 53ØE CØ 53ØF DD7EØ7 5315 DD7EØ7 5318 FD77Ø1	01080 01090 01100 01110 01120 01130 01140 01150 01170 01180 01200 01210 01220 01230 01240 01250 01250		CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+0), A A, (IX+12) (IY+1), A	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CØ 530F DD7E07 5312 FD7700 5315 DD7E0C 5318 FD7701 531B 2A7EFF	01080 011090 011100 011110 011120 011140 01150 01160 01170 01200 01200 01220 01220 01230 01240 01250 01270		CALL POP CALL LD ADD LD INC LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12) (IY+1), A HL, (HLDARE)	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER.
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FF 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53ØB CD2444 53ØB CD2444 53ØB CD7EØ7 5312 FD77ØØ 5315 DD7EØ7 5315 PD77Ø1 5318 FD77Ø1 5318 FD77Ø1 5318 FD77Ø1 5318 FD75Ø2	01080 01090 01100 01110 01110 01130 01140 01150 01160 01170 0120 01210 01210 01220 01230 01240 01250 01260 01270 01280		CALL POP CALL LD ADD LD INC LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR
52F7 D1 52F8 CD6053 52F8 210E00 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CD 530F DD7E07 5312 FD7700 5315 DD7E0C 5318 FD7701 5318 FD7701 5318 FD7502 5321 FD7403	01080 01090 01100 01110 01110 01150 01160 01170 01180 01200 01210 01220 01230 01240 01250 01260 01270 01280 01280		CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+Ø),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR.
52F7 D1 52F8 CD6Ø53 52FB 21ØEØØ 52FF 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53Ø9 Ø6ØØ 53ØB CD2444 53ØE CØ 53ØF DD7EØ7 5312 FD77ØØ 5318 FD77Ø1 531B 2A7EFF 531E FD75Ø2 5321 FD75Ø2 5321 FD75Ø2 5324 Ø1ØØØ	01080 01090 01100 01110 01112 01130 01150 01160 01170 01200 01210 01220 01240 01250 01260 01270 01280 01290 01290 01290 01290		CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+0),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER.
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 5308 CD2444 5308 CD2444 530E Q7 5315 DD7E07 5312 FD7700 5315 DD7E07 5318 PD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5321 FD7403 5321 FD7403 5321 FD7403 5321 FD7403	01080 01090 01100 01110 01110 01150 01160 01170 01180 01200 01200 01210 01250 01260 01270 01280 01270 01300 01310		CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR.
52F7 D1 52F8 CD6Ø53 52F8 21ØEØØ 52FF 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53ØB CD2444 53ØE CØ 53ØB CD2444 53ØE CØ 5315 DD7EØ7 5312 FD77ØØ 5315 DD7EØC 5318 FD77Ø1 5318 FD77Ø1 5318 FD77Ø1 5318 FD77Ø1 5312 FD74Ø3 5324 Ø1ØØØ 5327 CD4244 532A CØ	01080 01090 01100 01110 01112 01130 01150 01160 01170 01200 01210 01220 01240 01250 01260 01270 01280 01290 01290 01290 01290	NXTREC	CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+0),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD
52F7 D1 52F8 CD6053 52F8 210E00 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 530B CD2444 530E CD 530F DD7E07 5312 FD7700 5315 DD7E0C 5318 FD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5324 010000 5327 CD4244 532A CØ 532B CD3644	01080 01090 01100 01110 01110 01150 01160 01170 01180 01200 01200 01210 01250 01260 01270 01280 01270 01300 01310	NXTREC	CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK,
52F7 D1 52F8 CD6Ø53 52F8 21ØEØØ 52FF 19 52FF 7E 53ØØ 23 53Ø1 66 53Ø2 6F 53Ø3 E5 53Ø4 FDE1 53Ø6 21ØØ7Ø 53ØB CD2444 53ØE CØ 53ØB CD2444 53ØE CØ 5315 DD7EØ7 5312 FD77ØØ 5315 DD7EØC 5318 FD77Ø1 5318 FD77Ø1 5318 FD77Ø1 5318 FD77Ø1 5312 FD74Ø3 5324 Ø1ØØØ 5327 CD4244 532A CØ	01080 01090 01100 01110 01110 011140 01150 01160 01170 0120 01210 01210 01220 01230 01240 01250 01260 01270 01280 01290 01310 01310	NXTREC	CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN NZ	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK,
52F7 D1 52F8 CD6053 52F8 210E00 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 530B CD2444 530E CD 530F DD7E07 5312 FD7700 5315 DD7E0C 5318 FD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5324 010000 5327 CD4244 532A CØ 532B CD3644	01080 01090 01100 01110 01110 01130 01140 01150 01160 01170 01200 01210 01220 01230 01240 01250 01270 01250 01270 01300 01310 01310	NXTREC	CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+Ø),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø POSN NZ READ	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK,
52F7 D1 52F8 CD6053 52F8 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CØ 530F DD7E0C 5318 FD7700 5318 PD7780 5318 PD7780 5318 PD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5324 Q10000 5327 CD4244 532A Q3 532B CD3644 532E CØ	01080 01090 01100 01110 01112 01130 01150 01160 01170 01200 01200 01210 01220 01240 01250 01240 01250 01260 01310 01310 01310 01310	. NXTREC	CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+0), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN NZ READ NZ	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK,
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CD 530F DD7E07 5312 FD7700 5315 DD7E07 5315 DD7E0C 5318 FD7701 5318 2A7EFF 531E FD7502 5321 FD7502 5321 FD7403 5324 010000 5327 CD4244 532A C0 532B CD3644 532B CD3644 532E C0 532F D5	01080 01090 01100 01110 01110 01150 01160 01170 01180 01200 01200 01200 01240 01250 01260 01270 01300 01310 01310 01310 01310	NXTREC	CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+Ø),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø POSN NZ READ NZ DE IY	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK, ;IF ERROR
52F7 D1 52F8 CD6053 52F8 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CD 5315 DD7E00 5315 DD7E00 5315 DD7E00 5315 PD7701 5318 FD7701 5318 FD7701 5318 FD7502 5321 FD7403 5324 01000 5327 CD4244 532A CØ 532B CD3644 532E CØ 5336 FDE5	01080 01090 01100 01110 01110 011140 01150 01160 01170 01120 01210 01210 01220 01240 01250 01260 01270 01310 01310 01310 01310 01310 01350 01360	NXTREC	CALL POP CALL LD ADD LD INC LD	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN NZ READ NZ DE	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK,
52F7 D1 52F8 CD6053 52F8 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CØ 530F DD7E0C 5318 FD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5322 CD4244 532A CØ 532B CD3644 532B CD3644 532E CØ 5336 FDE5 5330 FDE5 5330 FDE5 5330 FDE5 5330 FDE5 5332 SEZE	01080 01090 01100 01110 01110 011140 01150 01160 01170 01200 01200 01200 01210 01210 01210 01230 01240 01250 01250 01270 01310 01320 01310 01320 01330 01340 01350 01360 01370 01380	. NXTREC	CALL POP CALL LD ADD LD L	DE, LINE1 DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+0), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN NZ READ NZ DE IY A,'.' 33H	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK, ;IF ERROR
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CD 5315 DD7E00 5315 DD7E00 5315 DD7E00 5315 DD7E00 5315 DT700 5315 DT700 5315 DT700 5315 DT700 5316 FD7701 5318 FD7701 5318 CAPEFF 5312 FD7403 5321 FD7403 5324 010000 5327 CD4244 532A CØ 532B CD3644 532B CD3644 532B CD3644 532B CD3644 532B CD3644 532B CD36300 5337 FDE1	01080 01090 01100 01110 01110 01110 01150 01160 01170 01200 01210 01220 01240 01250 01260 01270 01300 01310 01310 01340 01350 01360 01370 01380 01380 01380 01380	. NXTREC	CALL POP CALL LD ADD LD L	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN NZ READ NZ DE IY A,'.' 33H IY	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK, ;IF ERROR
52F7 D1 52F8 CD6053 52F8 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CD 5315 DD7E07 5315 FD7700 5315 DD7E07 5315 FD7701 5316 FD7502 5321 FD7403 5324 010000 5327 CD4244 532A C0 532B CD3644 532E C0 532B CD3644 532E C0 532B CD3644 532E C0 532B CD3644 532E C0 533B FDE5 5330 FDE5 5330 FDE5 5330 FDE5 5330 D1	## 01080	. NXTREC	CALL POP CALL LD ADD LD L	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+Ø),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø POSN NZ READ NZ DE IY A,'.' 33H IY DE	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK, ;IF ERROR
52F7 D1 52F8 CD6053 52F8 210E00 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 530B CD2444 530E CD 5315 DD7E07 5312 FD7700 5315 DD7E07 5315 FD7701 5318 FD7701 5318 FD7701 5318 FD7701 5318 FD7701 5318 FD7701 5318 CA7EFF 531E FD7502 5321 FD7403 5324 010000 5327 CD4244 532A CV 532B CD3644 532E CV 532B CD3644 532E CV 533B FDE5 5330 FDE5 5330 FDE5 5331 FDE1 5339 D1 533A E5	01080 01090 01100 01110 01112 011130 01150 01160 01170 01180 01200 01200 01240 01250 01250 01250 01310 01310 01310 01310 01350 01360 01370 01380 01370 01380 01370 01380 01340 01370 01380	. NXTREC	CALL POP CALL LD ADD LD L	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+Ø),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø POSN NZ READ NZ READ NZ DE IY A,'.' 33H IY DE HL	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK, ;IF ERROR
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 5308 CD2444 530E DD7E07 5312 FD7700 5315 DD7E07 5318 FD7701 5318 2A7EFF 531E FD7502 5318 FD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5327 CD4244 532A CU 532B CD3644 532B CD3644 532B CD3644 532B CD36300 5337 FDE1 5330 FDE5 5330 FDE5 5330 FDE5 5330 FDE5 5331 FDE1 5339 D1 533A E5 533B D5	01080 01090 01100 01110 01110 01110 01150 01160 01170 01200 01200 01200 01210 01220 01230 01240 01250 01250 01360 01370 01360 01370 01360 01370 01380 01360 01370 01380 01390 01410 01410	. NXTREC	CALL POP CALL LD ADD LD L	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+0), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN NZ DE IY A,'.' 33H IY DE HL DE	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK, ;IF ERROR
52F7 D1 52F8 CD6053 52F8 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 23 5309 0600 5308 CD2444 530E CD7700 5315 DD7E07 5312 FD7700 5315 DD7E07 5318 FD7701 5318 FD7701 5318 FD7701 5318 FD7502 5321 FD7403 5324 010000 5327 CD4244 532B CD3644 532B CD3644 532B CD3644 532B CD3644 532B CD3645 5337 FDE5 5330 FDE5 5330 FDE5 5330 FDE5 5331 FDE5 5331 FDE5 5331 FDE5 5331 FDE5 5332 FDE5 5333 FDE5 5333 FDE5 5333 FDE5 5333 FDE5 5334 FD33600 5337 FDE1 5333 D5 5333 C5	01080 01090 01100 01110 01110 01110 01150 01160 01170 01180 01210 01210 01210 01220 01260 01270 01280 01270 01310 01310 01310 01310 01310 01310 01310 01310 01310 01310 01340 01370 01470	. NXTREC	CALL POP CALL LD ADD LD L	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L, A HL IY HL, BUFFER B, Ø OPENEX NZ A, (IX+7) (IY+Ø), A A, (IX+12) (IY+1), A HL, (HLDARE) (IY+2), L (IY+3), H BC, Ø POSN NZ READ NZ DE IY A,'.' 33H IY DE HL DE BC	;FIND DIR POS ;HL POINTS TO DIR POS ;SEE TRSDOS MANUAL PG. 6-9 ;IF ERROR ;GET DEC ;LOAD MINIDIR WITH DEC ;GET ERN ;PUT IN MINIDIR ;BEGINNING OF STORAGE POINTER. ;INTO MINIDIR. ;POINT TO FIRST RECORD ;GET RECORD FROM DISK, ;IF ERROR ;DISPLAY FOR EACH SECTOR
52F7 D1 52F8 CD6053 52F8 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 530B CD2444 530E CD 530F DD7E07 5312 FD7700 5315 DD7E0C 5318 FD7701 5315 FD7700 5315 FD7701 5318 FD7701 5318 FD7701 5318 FD7701 5318 FD7701 5318 FD7701 5318 FD7502 5321 FD7403 5324 010000 5327 CD4244 5322 CV 532B CD3644 532E CV 532B CD3644 532E CV 533B D5 533G FDE5 533B D5 533A E5 533B D5 533C C5 533D D1 553C C5 533D D1 553C C5	01080 01090 01100 01110 01110 011140 01150 01160 01170 01180 01200 01200 01210 01220 01230 01240 01250 01250 01310 01310 01310 01310 01310 01310 01310 01340 01360 01370 01380 01340 01410 01410 01420 01440	NXTREC	CALL POP CALL LD ADD LD LD LD PUSH POP LD	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+Ø),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+1),A HL, (HLDARE) READ NZ READ NZ DE IY A,'.' 33H IY DE HL DE BC HL, BUFFER+255	; FIND DIR POS ; HL POINTS TO DIR POS ; SEE TRSDOS MANUAL PG. 6-9 ; IF ERROR ; GET DEC ; JOAD MINIDIR WITH DEC ; GET ERN ; PUT IN MINIDIR ; BEGINNING OF STORAGE POINTER. ; INTO MINIDIR. ; POINT TO FIRST RECORD ; GET RECORD FROM DISK, ; IF ERROR ; DISPLAY FOR EACH SECTOR ; POINT TO END OF DISK BUFFER.
52F7 D1 52F8 CD6053 52F8 10E000 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5308 CD2444 530E CØ 530F DD7E0C 5318 FD7701 5318 2A7EFF 531E FD7502 5318 FD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5324 010000 5327 CD4244 532A CØ 532B CD3644 532A CØ 532B CD3644 532B CD3644 532A CØ 5337 FDE1 5339 FDE5 5330 FDE5 5330 FDE5 5331 ESEE 5334 CD3300 5337 FDE1 5339 D1 5337 FDE1 5339 D1 533A E5 533B D5 533C C5 533D 21FF700 5340 ED5B7EFF	01080 01090 01100 01110 01110 011140 01150 01160 01170 01200 01200 01210 01220 01230 01240 01250 01240 01250 01310 01310 01310 01310 01310 01310 01310 01310 01310 01310 01340 01340 01340 01340 01350 01360 01370 01380 01340 01340 01350 01360 01370 01380 01410 01420 01420 01430 01410 01420 01430	NXTREC	CALL POP CALL LD ADD LD LD LD PUSH POP LD	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+0),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø POSN NZ READ NZ DE IY A,'.' 33H IY DE HL DE EC HL, BUFFER+255 DE, (HLDARE)	; FIND DIR POS ; HL POINTS TO DIR POS ; SEE TRSDOS MANUAL PG. 6-9 ; IF ERROR ; GET DEC ; LOAD MINIDIR WITH DEC ; GET ERN ; PUT IN MINIDIR ; BEGINNING OF STORAGE POINTER. ; INTO MINIDIR. ; POINT TO FIRST RECORD ; GET RECORD FROM DISK, ; IF ERROR ; DISPLAY FOR EACH SECTOR ; POINT TO END OF DISK BUFFER. ; POINT TO BEGINNING OF FREE STORAGE
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5309 CD2444 530E CD2444 530E CD7607 5312 FD7700 5315 DD7E07 5312 FD7700 5315 DD7E07 5318 PD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5324 010000 5327 CD4244 532A CD 532B CD3644 532B CD3644 532B CD3644 532B CD3644 532B CD36300 5337 FDE1 5330 FDE5 5330 FDE5 5330 FDE5 5330 SE2E 5334 CD3300 5337 FDE1 5338 D5 533C C5 533D 21FF70 5340 ED5B7EFF 5344 010001	01080 01090 01100 01110 01110 01110 01150 01160 01170 01200 01200 01200 01210 01220 01230 01240 01250 01250 01360 01370 01360 01370 01380 01360 01370 01380 01380 01380 01410 01410 01420 01430 01440 01450 01450 01450 01460	NXTREC	CALL POP CALL LD ADD LD L	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+Ø),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+1),A HL, (HLDARE) READ NZ READ NZ DE IY A,'.' 33H IY DE HL DE BC HL, BUFFER+255	; FIND DIR POS ; HL POINTS TO DIR POS ; SEE TRSDOS MANUAL PG. 6-9 ; IF ERROR ; GET DEC ; LOAD MINIDIR WITH DEC ; GET ERN ; PUT IN MINIDIR ; BEGINNING OF STORAGE POINTER. ; INTO MINIDIR. ; POINT TO FIRST RECORD ; GET RECORD FROM DISK, ; IF ERROR ; DISPLAY FOR EACH SECTOR ; POINT TO END OF DISK BUFFER. ; POINT TO BEGINNING OF FREE STORAGE ; NO. OF BYTES IN A RECORD.
52F7 D1 52F8 CD6053 52F8 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 23 5309 0600 5308 CD2444 530E CD 5318 FD7700 5315 DD7E07 5312 FD7700 5315 DD7E07 5318 FD7701 5318 FD7701 5318 FD7701 5318 FD7502 5321 FD7403 5324 010000 5327 CD4244 532A CV 532B CD3644 532B CD3644 532B CD3644 532B CD3644 532B CD3644 532B CD3645 5337 FDE5 5330 FDE5 5330 FDE5 5331 BE5 5331 BE5 5332 BE2E 5334 CD3300 5337 FDE1 5339 D1 533A E5 533B C5 533D 21FF70 5340 ED5F7EF 5344 010001 5347 EDB8	01080 01090 01100 01110 01110 011140 01150 01160 01170 01180 01210 01210 01210 01220 01230 01240 01250 01260 01270 01280 01270 01380 01370 01310 01310 01310 01310 01340 01410 01420 01420 01410 01420 01420 01420 01420 01420 01420 01420 01420	NXTREC	CALL POP CALL LD ADD LD LD LD PUSH POP LD	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+0),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø POSN NZ READ NZ DE IY A,'.' 33H IY DE HL DE EC HL, BUFFER+255 DE, (HLDARE)	; FIND DIR POS ; HL POINTS TO DIR POS ; SEE TRSDOS MANUAL PG. 6-9 ; IF ERROR ; GET DEC ; LOAD MINIDIR WITH DEC ; GET ERN ; PUT IN MINIDIR ; BEGINNING OF STORAGE POINTER. ; INTO MINIDIR. ; POINT TO FIRST RECORD ; GET RECORD FROM DISK, ; IF ERROR ; DISPLAY FOR EACH SECTOR ; POINT TO END OF DISK BUFFER. ; POINT TO BEGINNING OF FREE STORAGE
52F7 D1 52F8 CD6053 52FB 210E00 52FF 19 52FF 7E 5300 23 5301 66 5302 6F 5303 E5 5304 FDE1 5306 210070 5309 0600 5309 CD2444 530E CD2444 530E CD7607 5312 FD7700 5315 DD7E07 5312 FD7700 5315 DD7E07 5318 PD7701 5318 2A7EFF 531E FD7502 5321 FD7403 5324 010000 5327 CD4244 532A CD 532B CD3644 532B CD3644 532B CD3644 532B CD3644 532B CD36300 5337 FDE1 5330 FDE5 5330 FDE5 5330 FDE5 5330 SE2E 5334 CD3300 5337 FDE1 5338 D5 533C C5 533D 21FF70 5340 ED5B7EFF 5344 010001	01080 01090 01100 01110 01110 011140 01150 01160 01170 01180 01210 01210 01210 01220 01230 01240 01250 01260 01270 01280 01270 01380 01370 01310 01310 01310 01310 01340 01410 01420 01420 01410 01420 01420 01420 01420 01420 01420 01420 01420	NXTREC	CALL POP CALL LD ADD LD L	DE, LINEI DISPLA DE DISPLA HL, OFFSET HL, DE A, (HL) HL H, (HL) L,A HL IY HL, BUFFER B,Ø OPENEX NZ A, (IX+7) (IY+0),A A, (IX+12) (IY+1),A HL, (HLDARE) (IY+2),L (IY+3),H BC,Ø POSN NZ READ NZ DE IY A,'.' 33H IY DE HL DE EC HL, BUFFER+255 DE, (HLDARE)	; FIND DIR POS ; HL POINTS TO DIR POS ; SEE TRSDOS MANUAL PG. 6-9 ; IF ERROR ; GET DEC ; LOAD MINIDIR WITH DEC ; GET ERN ; PUT IN MINIDIR ; BEGINNING OF STORAGE POINTER. ; INTO MINIDIR. ; POINT TO FIRST RECORD ; GET RECORD FROM DISK, ; IF ERROR ; DISPLAY FOR EACH SECTOR ; POINT TO END OF DISK BUFFER. ; POINT TO BEGINNING OF FREE STORAGE ; NO. OF BYTES IN A RECORD.

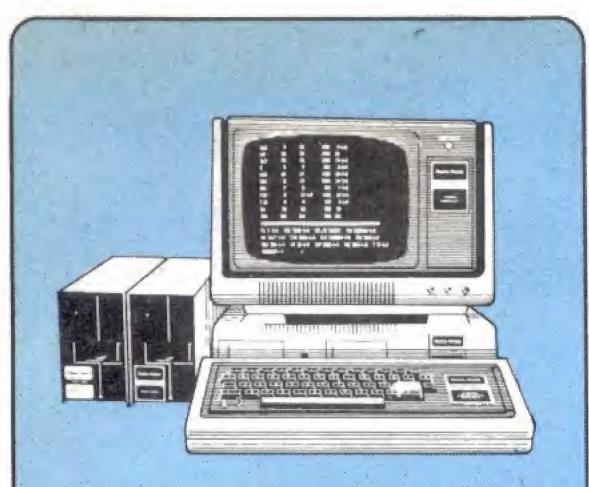
specifies the /SYS files to be loaded.

When a new system overlay is requested by the system, the modified system overlay loader calls TSYS. TSYS hunts through the mini-directory and looks for an entry that has the correct DEC. If that is not found, it executes the code which reads the /SYS file from disk. If found, HLDARE is modified to point to the first sector of the file in memory. The resident system has a routine which reads in a machine language object file, places it in the proper memory locations, and finds the execution address. The portion of the code which reads the next sector is modified to get it from memory via TREAD, by changing the code specified by VECTOR to point to TREAD instead of the disk read routine in the resident system. TSYS calls the machine language file loader, which reads in the file. Once accomplished, control is returned to the system overlay loader, which executes the code.

TREAD simply transfers the /SYS sector pointed to by HLDARE. to the system buffer, the location of which varies between operating systems. Then, it adjusts the HLDARE pointer to the next sector and returns to the calling routine.

After you have MEMSYS up and running on your favorite operating system, try putting a data disk in drive one, a data disk in drive zero. and copying files, one at a time, between disks. Who says you need three drives? Sure it's nice to have that many drives, but we don't all need this much storage. If you're running NEWDOS, there will still be a short delay before any CMD function is executed. NEWDOS still must move BASIC and its pointers up against the bottom of the MEMSYS system before it can execute the DOS command. Try running some of the Radio Shack accounting software and see how much faster it runs. We haven't done any benchmark tests, but we noticed that disk accesses seem to be almost instantaneous. In many cases where disk accesses were formerly required, they now operate without any delay. A new freedom from the confines of DOS are now available to you.

534D Cl	Ø149Ø	POP	BC		
534E D1	Ø1500	POP	DE		
534F El	Ø151Ø	POP	HL		
5350 03 5351 79	Ø152Ø Ø153Ø	INC	BC	COUNT UP TO NEXT RECORD	
5352 FDBEØ1	Ø154Ø	LD CP	A,C (IY+1)	;MAKE SURE WE'RE NOT ;READING PAST FND	
5355 20D0	Ø155Ø	JR	NZ, NXTREC	NOT THERE YET, SO READ ANOTHER.	
5357 D5	Ø157Ø	PUSH	DE		
5358 115472 535B CD6Ø53	Ø158Ø Ø159Ø	LD	DE,LINE2		
535E D1	Ø16ØØ	CALL FOP	DISPLA DE		
535F C9	01610	RET		BACK AND READ ANOTHER FILE	
	Ø162Ø	TIES ATTEMN ON O			
				ILL DISPLAY THE STRING ND TERMINATED BY	
		ZERO BYTE.	I MEGISTER DE	UND TERMINATED BY	
E 260 PF	Ø166Ø				,
536Ø D5 5361 lA	Ø167Ø DI Ø168Ø L2		DE (DE)		
5362 B7	Ø169Ø	LD OR	A, (DE) A	; IS IT A ZERO?	
5363 28ØC	Ø17ØØ	JR	Z, ENDMSG	; IF SO THEN QUIT WRITING.	
5365 D5	Ø171Ø	PUSH	DE		
5366 FDE5 5368 CD33ØØ	Ø172Ø Ø173Ø	PUSH CALL	IY 33H		
536B FDE1	01740	POP	IY		
536D D1	Ø175Ø	POP	DE		
536E 13 536F 18FØ	Ø176Ø	INC	DE	; POINT TO NEXT BYTE.	
536F 18FW 5371 Dl	Ø177Ø Ø1780 EN	JR DMSG POP	L2 DE	PRINT IT.	
5372 C9	Ø179Ø	RET	DL		
	01800				
	Ø181Ø ;T	HE NEXT SEC	TION OF CODE IS	THAT WHICH "OPENS" THE	
	Ø183Ø	ISTEM ENTRY	IN THE MINI D	RECTORY.	
FFØØ	Ø1840	ORG	ØFFØØH		
FFØØ DDE5 FFØ2 E5	Ø1850 TS		IX		
FFØ3 D5	Ø186Ø Ø187Ø	PUSH	HL		
FFØ4 C5	Ø188Ø	PUSH PUSH	DE BC		
FF05 2A964C	Ø1882	LD	HL, (VECTOR)		
FFV8 227CFF	Ø1884	LD	(STRVEC), HL		
FFØB 2142FF FFØE 22964C	Ø189Ø Ø19ØØ	LD	HL, TREAD (VECTOR), HL	; MODIFY ORG SYS OBJECT	100
FF11 78	Ø191Ø	LD	A,B	; FILE LOADER TO GET SECTORS FROM : ; B HAS DEC	MEMO
FF12 218ØFF	Ø192Ø	LD	HL, SYlvar	HUNT THRU MINIDIR ENTRIES FOR FI	LE
FF15 110400 FF18 0620	Ø193Ø Ø194Ø	LD	DE,4		
FFLA BE	Ø195Ø L1	CP	B,32 (HL)		
FF1B 28Ø5	Ø196Ø	JR	Z, TOPEN		
FFID 19	Ø197Ø	ADD	HL, DE		
FF1E 10FA FF20 1830	Ø198Ø Ø199Ø	DJNZ JR	Ll RDDISK	; LOOK THRU ALL OF THEM.	DTON
FF22 EB	Ø2ØØØ TOE		DE,HL	; NOT FOUND, SO WE'LL GET IT FROM I	DISK
FF23 D5	02010	PUSH	DE		
FF24 DDE1 FF26 DD6EØ2	Ø2Ø2Ø Ø2Ø3Ø	POP LD	IX		
FF29 DD66Ø3	02040	LD	L,(IX+2) H,(IX+3)	; FIND FILE IN MEMORY	
FF2C 227EFF	02050	LD	(HLDARE),HL		
FF2F CD394C	Ø2Ø6Ø	CALL	4C39H	; CALL ORG SYS OBJECT FILE LOADER	
FF32 22FC4B FF35 2A7CFF	Ø2Ø7Ø Ø2Ø8Ø	LD	(4BFCH),HL HL,(STRVEC)	EXECUTION ADDRESS.	
FF38 22964C	02090	LD	(VECTOR), HL	; RESTORE DISK VECTOR TO LOADER.	
FF3B AF	02100	XOR	A		
FF3C Cl FF3D Dl	Ø211Ø Ø212Ø	POP	BC		7
FF3E E1	Ø212Ø Ø213Ø	POP POP	DE HL		
FF3F DDE1	02140	POP	IX		
FF41 C9	Ø215Ø	RET			
	Ø216Ø	TE MEVIL CEOU	TON OF CODE TO	CALLED BY THE ORIGINAL	
	Ø218Ø ;SY	STEM'S OBJECT	OF CODE IS	WHEN IT NEEDS THE NEXT	
	Ø219Ø ;SE	CTOR OF THE	OVERLAY.	THE PLANT OF THE PARTY.	
FF42 2A7EFF	Ø22ØØ	120 *0	· ()		
FF45 11FF4D	Ø221Ø TRE Ø222Ø	AD LD LD	HL, (HLDARE)	1	
FF48 Ø1ØØØ1	Ø223Ø	LD	DE,4DFFH BC,256		,
FF4B EDB8	02240	LDDR	•		
FF4D 227EFF FF5Ø AF	Ø225Ø Ø226Ø	LD	(HLDARE),HL	dia ve rope	
FF51 C9	0227Ø	XOR RET	A	;SEI NO ERROR	
	Ø228Ø				
	Ø229Ø ;TH	E NEXT SECT	ION OF CODE IS	EXECUTED IF THE	
	Ø23ØØ ;OV Ø231Ø	erlay has no	OT BEEN PLACED	IN MEMORY.	
FF52 2A7CFF	Ø232Ø RDD	ISK LD	HL, (STRVEC)		
FF55 22964C	Ø233Ø	LD	(VECTOR),HL		
FF58 Cl		DOD	BC		
FF59 D1	Ø234Ø Ø235Ø	POP POP	DE		



TRS-80 MODEL I

DISK INTERFACING GUIDE

\$5.95
POSTPAID
FIRST CLASS
(United States Only)

\$7.95 Foreign Airmail (U.S. Funds)

Send to:

80-N.W. Books 3838 South Warner St. Tacoma, WA 98409 (206) 475-2219

Dealer Inquiries Invited

TRS-80 is a registered trademark of Tandy Corporation

Send Copies of the Guide
Check Enclosed
Visa or MasterCard
#
Exp. Date
Signature
Name
Address
City
StateZip
A Division of 80-Northwest Publishing, Inc.
80.NW
Books

Grab TRSDOS

FF5A E1 FF5B DDE1	Ø236Ø Ø237Ø Ø238Ø	POP POP	HL IX
		XT SECTI	ON OF CODE IS THAT WHICH MODIFIES THE
	02400 ;SYSTEM 02410		
4BCE	02420 OLDSYS	EQU	4BCEH
FF5D FDE5	Ø243Ø PATCH	PUSH	IY
FF5F CDØØFF	02440	CALL	TSYS
FF62 FDE1	02450	POP	IY
FF64 C20944	02460	JP	NZ,4409H
FF67 00	02470	NOP	
FF68 00	02480	NOP	
FF69 00	02490	NOP	
FF6A 00	02500	NOP	
FF6B 00	02510	NOP	
FF6C 00	02520	NOP	
FF6D 00 FF6E 00	Ø253Ø	NOP	
FF6F ØØ	Ø254Ø Ø255Ø	NOP	
FF70 00	02560	NOP	
FF71 00	02570	NOP	
FF72 ØØ	02580	NOP	
FF73 00	02590	NOP	
FF74 00	02600	NOP	
FF75 00	02610	NOP	
FF76 00	02620	NOP	
FF77 00	02630	NOP	
FF78 00	02640	NOP	
FF79 00	02650 PEND	NOP	
FF7C	Ø266Ø	ORG	TSYS+7CH
FF7C 0000	Ø2665 STRVEC	DEFW	Ø
FF7E FFFE 0080	02670 HLDARE 02680 SY1VAR	DEFW DEFS	TSYS-1 128 ;MINIDIR AREA
4424	Ø269Ø OPENEX	EQU	4424H
4442	02700 POSN	EQU	4442H
4436	Ø271Ø READ	EQU	4436H
4428	Ø272Ø CLOSE	EQU	4428H
4409	02730 DERREX	EQU	44Ø9H
7000	02740 BUFFER	EQU	7000H
7200	02750	ORG	72ØØH
7200 1C	02760 SGNMSG	DEFB	28 ; HOME CURSOR
7201 1F	02770	DEFB	31 ;CLS
72Ø2 4D	02780	DEFM	'MEMSYS FOR TRSDOS 2.3 VER 1.0'
7220 ØD	02790	DEFB	ØDH
7221 43	02800	DEFM	'COPYRIGHT 1981 BY MICHAEL D. ANDREAS'
7245 ØD	Ø281Ø	DEFB	ØDH Ø
7246 00	Ø282Ø	DEFB	
7247 52 7253 ØØ	02830 LINE1 02840	DEFM DEFB	'READING
7254 20	02850 LINE2	DEFM	' - NOW IN MEMORY'
7265 ØD	02860 LINE2	DEFB	ØDH IN HELDRI
7266 00	02870	DEFB	Ø
000E	02880 OFFSET	EQU	14
4096	Ø2885 VECTOR		4C96H
5200	02890	END	INITSY
	ERRORS AREA BYTES LEF	r	

Listing 3

NEWDOS 2.1 PATCHES-- ALL THE DBLDOS

Listing 2			PATCHES EXCEPT LINES 432-806 CHANGE 'DEFB' TO 'DEFW' IN LINES				
1					0,940,970.		
			ADD TH	ESE LINE	S		
		*	431	JR	NZ, ERREXT		
432	JR	NZ, ERREXT	432	LD	DE, SYS11		
434	LD	DE, SYS7	433	CALL	TUKSYS		
436	CALL	TUKSYS	434	JR	NZ, ERREXT		
802 SYS7	DEFM	'SYS7/SYS.LØY4'	435	LDa	DE, SYS12	,	
804	DEFB	Ø -	436	CALL	TUKSYS		
806	DEFW	ØFF98H	437	JR	NZ, ERREXT		
1255	INC	A	438	LD	DE, SYS13		
1840	ORG	ØFEFAH	439 _	CALL	TUKSYS		
2202 TREAD	PUSH	HL					
2204	PUSH	DE	801 SY	S13 DEF	M 'SYS13/SYS.	LOY4'	
2206	PUSH	BC	8Ø2	DEF			
2210	LD	HL, (HLDARE)	803		W ØFFAØH		
2220	LD	DE,42FFH	8Ø4 SY	S12 DEF	M 'SYS12/SYS.I	ØY4'	
2252	POP	BC	8Ø5		ВØ	2.5%	
2254	POP	DE	806		W ØFF9CH		
2256	POP	HL			M 'SYS11/SYS.	ØY4'	
2660	ORG	TSYS+82H	808	DEF			
2780	DEFM	'MEMSYS FOR DOUBLEDOS	8Ø9		w ØFF98H		
		4.23 VER 1.0	2780		EMSYS FOR NEW	os 2.1V1.0'	
2885 VECTOR	EQU	4C9ØH	2880 0		QU 15 🔳		

Bigger volume and lower production costs now make Lobo high performance disk systems and accessories even more affordable.

Whether your TRS-80 is a Model I, II, or III, you've probably wished for more disk capacity Now Lobo gives you that—and much more—at low, manufacturer-direct prices. With uncompromising quality, and the protection of Lobo's unique 1-year warranty



Special for Model I owners: the LX-80 Expansion Interface

Radio Shack may have forgotten you, but Lobo hasn't! Our LX-80 expansion interface (plus LDOS operating system) gives your Model I more features and more expandability than a Model II or III The sturdy steel enclosure fits under your monitor and adds

- 32k additional RAM
- · Interfaces for standard Radio Shack minifloppy drives and Lobo high-performance disk systems
- · Centronics-type printer port plus screen printer port
- Two RS-232C serial ports (optional)
- Plus a real-time clock, sockets for custom ROM, and a heavy-duty power supply for your keyboard unit

Discover the real power and potential of your Model I, with the bargain-priced Lobo 1 X-801

LX-80 with LDOS operating system (required) \$510.00 LX-80 without LDOS (for current LDOS users) \$460.00 Dual RS-232C serial port option \$100.00

LDOS: the ultimate TRSDOScompatible operating system

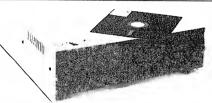
One of the few software products ever to receive a perfect box score from Infoworld magazine. The reviewer said. "LDOS 5.1 is awesome! ... It performs nearly perfectly a straightforward and simple system to use

the best manual for software I've ever seen or reviewed, bar none....This DOS takes the TRS-80 from the hobby category and endows it with features that many a so-called business system does not have LDOS offers unparalleled versatility and function."*

LDOS includes a powerful extended disk BASIC, smart terminal emulator, and many other useful utilities that make it worth far more than its low price. It runs on any Model I or Model III with at least one disk drive.

LDOS operating system (specify Model I or Model III) \$129.00

*© 1982 by Popular Computing/Inc a subsidiary of CW Communications/Inc Excerpted from INFOWORLD.



Add-on 8" floppies for Model II

Why pay Radio Shack prices to expand your Model II's disk capacity? The Lobo 8202C2 adds two 8" double-density floppy drives, for a total of 1.1 megabytes of additional storage. Installation and operation are identical, and you get the added benefit of Lobo's 1-year parts and labor warranty. 8202C2 dual-drive

8" floppy system for Model II

8" floppy systems for Model I and Model III

These rugged dual-drive systems attach to any Model I with LX-80 expansion interface, or any Model III, and add the mass storage you need for the big jobs. Double density recording stores 535kB on one side of the disk. Using the LDOS operating system (required) you get full compatibility with standard TRSDOS plus greatly increased capabilities

8202C3 two single-sided drives (1.1 MB total) for Model III \$1625.00 8202CX same as above, for Model I with LX-80 (sold separately) \$1249.00

5202C3 two double-sided drives \$1925.00 (2.2 MB total) for Model III

5202CX same as above, for Model I with LX-80 (sold separately) \$1549.00

Add-on minifloppy drives for Model I

Completely compatible with all Model I hardware and software, but with an extra 5 tracks for data storage Requires a Model I with either the Radio Shack expansion interface or the Lobo LX-80 (see left).

4401C Add-on 51/4" drive for Model I

\$305.00

High-capacity minifloppy for LX-80

An economical way to get a big storage boost for your LX-80-equipped Model I The double-sided, 96 track/inch drive stores 720. kB, and eliminates most tedious disk swapping

Model 4801C high-capacity 51/4" drive for LX-80 \$465.00

51/4" Winchester System

Compact and exceptionally reliable, with 4.8 megabytes of high-speed Winchester storage plus a 720 kilobyte floppy drive. The value leader in mass storage

950T for Model III or Model I with LX-80 (sold separately) \$2675.00

8" Winchester System

Over 9 million bytes of storage accessible in milliseconds: 8.2 MB on an 8" Winchester drive and another 1.1 MB on the backup floppy drive. Unsurpassed for maintaining very large data

1850T for Model III or Model I with LX-80 (sold separately) \$3459.00

Ordering Information

All prices include shipping and handling. California residents add 6% sales tax. Credit card orders shipped within 24 hours. Personal checks require 2-3 weeks for clearance before shipment. Please allow up to 6 weeks for delivery.

The Lobo Warranty

All Lobo hardware products carry a limited 1-year parts and labor warranty. Call or write for complete warranty statement.

TRS-80 and TRSDOS are trademarks of Tandy Corporation © 1982 Lobo Drives International

TOLL-FREE ORDER NUMBERS:

U.S. (except California);

800-235-1245





In California: 800-322-6103 or **800-322-6104** Hours 7AM--5PM Pacific Time

Write for free catalog:



Lobo Drives International

Dept. US10 358 S. Fairview Ave. Goleta, CA 93117

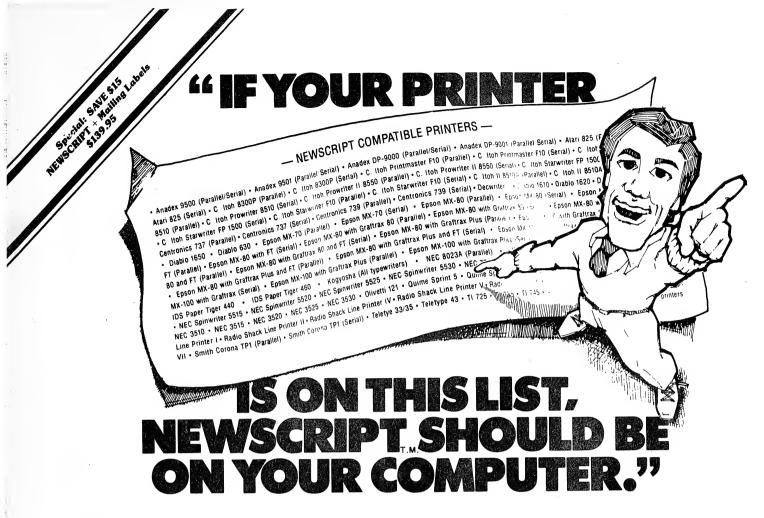
INTERNATIONAL

Prices subject to change without notice.



Winchester disk systems for Model I and Model III

The ultimate mass storage devices! Enormous capacity and impressive speed give your system a dramatic performance boost. Add the impressive file-handling capabilities of LDOS (included), and you can outperform systems costing far more. IMPORTANT. Many Winchester disks now being sold have no provision for file backup Lobo systems include a built-in highdensity floppy drive that can store the entire contents of the hard disk on just 6 or 7 floppies This backup drive is also usable for additional on-line storage of programs and data



NEWSCRIPT'S exclusive print processor gives you total printer control.

NEWSCRIPT's exclusive print processor takes over where formatting leaves off with over 200 print processing and support features. NEWSCRIPT takes you beyond text formatting — beyond just printing text on paper. With NEWSCRIPT's Print processor you take full advantage of your printer's hardware and software features, creating an unsurpassed printed image. Text editing (the part you see), is only part of the job, printing is the other part — the part others will see.

NEWSCRIPT controls over 80 popular printers.

You don't even have to know how your printer works — only what it can do. NEWSCRIPT will do the rest with such major features as underlining, right justified proportional printing, top and bottom titles, top/bottom left-right-center page numbering, chaining and embedded printing of any length file with disk spanning, fully formatted merging of form letters with selective editing, boldface, sub/super scripts, character substitution/translation, table of contents, indexing,

hanging indents, paragraph numbering, line numbering, double width characters, italics, hard and soft hyphens, in-memory spooling, and many other features.*

NEWSCRIPT'S text editor has sophistication to match its print processing.

Buffered key entry rates to 450 characters per second — you never drop characters. Windowing to 240 characters, block move and copy within and between files, definable auto save, "HELP" and "WHOOPS" commands, repeat and query last command, search and replace within column and line limits as well as globally, and an automatic interface to the ELECTRIC WEBSTER spelling checker (sold separately).

NEWSCRIPT'S 277 page manual contains an introductory tutorial with explanations of the beginner's most common needs, a "How to Section" to help when you're stuck, a fully alphabetized description of the commands with literally hundreds of examples, a topical index with over 1,300 entries, and a handy quick-reference card (naturally!).

Start getting the printed results only NEWSCRIPT can give you for \$124.95. Requires TRS-80 Model I or III with 48K and 1 disk (minimum — 2 recommended)



is available at computer stores, selected B. Dalton Book Sellers, and selected independent book dealers. If your dealer is out of stock order direct. Include \$3.00 (domestic), \$6.00 (Canada) for shipping and handling. Foreign residents add \$15.00 plus purchase price, in U.S. funds.

TO ORDER, CALL NOW, TOLL-FREE: (800) 824-7888, Operator 422 Calif: (800) 852-7777, Oper. 422 Alaska/Hawaii: (800) 824-7919 For technical information call: (213) 764-3131, or write us.



Dept. C. Box 560, No. Hollywood, CA 91603

NEWSCRIPT companion programs (sold separately): MAILING LABELS \$29.95, DAISY WHEEL PROPORTIONAL \$49.95 (not required for Daisy Wheel II), PENCIL & SCRIPSIT FILE CONVERSION \$24.95, ELECTRIC WEBSTER (spelling checker and automatic correction) \$149.50, GEAP (TRS-80 graphics — requires Epson MX-80) \$49.95, DOTWRITER (Hi-res graphics — requires Epson MX-80/100 with Graftrax) \$69.95, GEAP/DOTWRITER combination (requires Epson MX-80/100 with Graftrax) \$99.95

EasyLink

Western Union on your TRS-80

For all models

EasyLink is a new, exciting telecommunications network that Western Union has opened up for the computer owner.

No longer are users restricted to a closed network such as CompuServe or The Source. You now have complete message sending and retrieval to others who are on or off the system.

Anyone who owns a computer, modem, and terminal software can use the system. Western Union is offering a communications service that consists of two major parts. EasyLink and the ACCESS system.

EasyLink began just last spring and now has over 5000 terminals connected. They expect to grow to over 10000 by 1983. Projections show that there are over three million communication terminals in the United States, and Western Union hopes to get at least ten percent of that market.

Through EasyLink, you have a complete store and forward message-switching service. All you need is an ASCII terminal that operates at 300 or 1200 baud. Messages may be addressed to Telex I and II terminals, any other compatible terminal, auto-answer terminals, or (and here is the real advantage) to a mailbox facility or any Western Union InfoMaster service.

For the business with branch outlets, a message can be sent directly through EasyLink to all offices. For those outlets without terminals, messages can be forwarded to the nearest postal outlet for delivery as a Mailgram. If you have an unknown number of customers who wish to contact you, messages can be sent to your

EasyLink mailbox and you can retrieve them as you wish.

Subscriber Outland

EasyLink offers a variety of message types. You can direct messages to another EasyLink subscriber, to a Telex I subscriber in the United States, to a Telex II user in the United States, or to a TWX user in Canada. For subscribers with international needs, you can send via International Telex (ITX) or Cablegram (INT). For sending messages to users who don't have terminals, or those who are not EasyLink subscribers, Western Union has the answer. Messages can be specified to be telegrams (PMS) or Mailgrams (ZIP) which are delivered by the postal service.

Message traffic can be outgoing or incoming. By far the largest use is for outgoing traffic. To access incoming messages, you would need to have an auto-answer modem or callup messages that are stored in your mailbox.

How is H Dane? EasyLink is quite simple to use. Each subscriber is assigned an identification code and password. These are verified by the EasyLink computer prior to accepting your message. All you need to do is powerup your computer and modem, run your terminal program, and call EasyLink. Type the code for your terminal type, I.D. code, name and password. If all is well, you get the response PTS for Proceed to Select.

Identify where and how you wish the message to be sent, and EasyLink responds with the letters GA, for Go Ahead. Then go back to the terminal program, load the ASCII text into your computer's

Cameron C. Brown, Editor

memory (RAM buffer), and send it. Text can be sent directly from keyboard input, but the primary use is to dump prewritten messages.

For TRS-80 owners, text is sent at 300 to 1200-baud (your modem determines this value), in ASCII, with even parity, one stop bit, and either half or full duplex. When receiving incoming text, you can specify that you have an 80- or 132character printer.

Ease of operation has been a goal in the development of this system. Subscribers can predetermine a set of addresses (up to 99) and dump a message to all of them at once. Operator codes are straightforward and use easy-to-remember mnemonics. The subscriber's manual is concise and clear, but it assumes that you understand your own computer, modem and terminal operation.

What Are the Fees? The cost savings can be tremendous. If your business Telex cost is now \$500 per month. EasyLink could possibly lower that by fifty percent. There is a \$25 registration fee. Auto-answer terminal connection is \$15 per month or, with a mailbox to receive messages, it is a total of \$25 per month. The cost per message is based upon connect time and baud rate. At 1200-baud, it is only \$.40 per minute, or \$.20 per minute for 300baud. Current TLX charges are \$.3745 per sixty characters. For some remote users, the cost of a Telex line is prohibitive. EasyLink may be the answer.

For businesses that require it. message costs can be billed to separate departments or indivi-

December, 1982 37

duals. This should help to simplify a number of accounting headaches. Nationwide, over thirty businesses are now using the TRS-80 Model II or III in conjunction with EasyLink.

The ACCESS Connection

For \$10 per month, you can join the ACCESS system. It gives you a priority mailing system that reaches worldwide. Through ACCESS, you can direct messages for one-day delivery as Mailgrams, two-day delivery via the U.S. Postal Service's electronically computer-originated message system (E-COM), or go for three-day plus delivery via a Computer Letter. With a Computer Letter, you can forward messages as well as enclose brochures and inserts. For international same-day delivery, there is the International Cablegram that goes to 150 countries. A new option is the International Priority Letter, which gives two-day delivery to Europe and the

United Kingdom, You do not have to join EasyLink to take advantage of the ACCESS system.

Security

Western Union offers no scrambling or message decoding. All transmissions are in plain text and go through regular communication networks, such as phone, microwave, satellite, etc. If you desire to keep your business information extremely confidential, and have needs beyond the normal password and identification procedures, the encoding and decoding of data is up to you. Western Union sends the ASCII file, it can be as scrambled as vou wish to make it.

New Options and the Future

User requests have led to some additions and changes in the service. Single messages are restricted to 15000 characters and this was too restrictive for some subscribers. Now, up to 50000 characters can be sent in a batch mode. If it happens that your branch office is closed when the message is sent, it can now be automatically rerouted to a second number or mailbox. It's nice to see a company that is still developing a system quick to nieet user needs.

Western Union's goal is to allow any hardware device to speak to any other piece of hardware. It may not be too long before we see modems attached to all of the IBM Selectric typewriters in the world. It's clear that once a keystroke is captured, Western Union wants to deliver it.

Ed. Note— This article is based upon interviews with Mr. David W. Hurley, Senior Communications Representative for Western Union. For further information, you may contact him, or Ed Links, at 655 South Orcas, Seattle, WA 98108, (206) 764-4578.

Extended BASIC

TRS-80 Color Computer

The Champagne of Software For a Beer Budget!

Over 75 quality programs a year

for under 75¢ each!

Ah, CHROMASETTE Magazine, the toast of the holiday season . . . and any season! A subscription to CHROMASETTE Magazine consists of 6 to 8 premium programs ON CASSETTE, delivered by First Class Mail to you and your computer every month! ·Tutorials, utilities, games, and practical programs to usher in a great new computing year!

So, celebrate and get a subscription to CHROMASETTE Magazine! Or just take a little sip and try a back issue.

The Bottom Line:

1 year (12 issues) \$45.00 6 months (6 issues)

\$25.00 \$ 500 Calif residents add 6% to single copies North America — First Class postage included

Overseas — add \$10 to subscriptions and \$1 to single copies

Sent AO rate

MasterCard/Visa

The Fine Print:

Single Copies

All issues from July 1981 available — ask for list Programs are for the Extended BASIC model and occasionally for disks

Chromosette Magazine P.O. Box 1087 Santa Barbara, CA 93102 (805) 963-1066

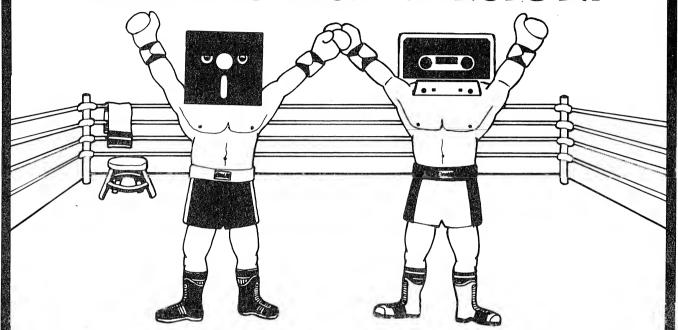


TRS-80 Model I

And In This Corner, Another Champion.....

TRS-80 Model III

CLOAD'S DISK VERSION!



Get 12 tapes OR disks a year containing over 75 quality programs — without knocking out your budget!

We finally gave in . . . After over FOUR years of publishing some of the best (aren't we pompous), useful and fun programs on tape, we are now offering **CLOAD**Magazine on disk, too!

A subscription to **CLOAD Magazine** (tape or disk) consists of 6 to 8 ready-to-load programs delivered by First Class Mail every month. What a winner!

Fight high software prices — Get a subscription to **CLOAD Magazine.** Or just throw a single punch and try a back issue . . .

The Bottom Line:	Tape	Disk
1 year (12 issues)	\$50 00	\$95 00
6 months (6 issues)	\$3000	\$55 00
Single Copies		
Back Issues	\$ 600	\$11.00
Good Games #1	\$1200	\$2300
Adventures #1	\$13.00	\$24 00

California residents add 6% to single copies North America — First Class postage included Overseas — add \$10 to subscriptions and \$1 to single copies Sent AO rate



(805) 962-6271

P.O. Box 1448 Santa Barbara, CA 93102

MasterCard/Visa

The Fine Print:

All issues from Oct 76 available on tape Issues from Oct 69 available on disk, also Fish for list (9: Level 1 issues also available)

Hard disk for Model III

Going full-blown with MTI's CP/M

Model III, PMC-80, LNW80

Harry Avant, La Crescenta, CA

The MTI C/140 is described by Microcomputer Technology, Incorporated as "...an exciting new personal and small business computer that is both CP/M and TRSDOS compatible." Features include CP/M 2.2 compatibility, 80 x 24 display, four-megahertz speed up, and full compatibility with TRSDOS software. A built-in diagnostic and monitor are also included. A well documented BASIC program is included with the computer that gives detailed instructions for using 80 x 24 with DOSPLUS.

MTI supplied a system for purposes of evaluation, equipped with two forty-track drives (Tandon), a CP/M board, an 80 x 24 display board, an external 7.5-megabyte hard disk (Tandon), DOSPLUS 3.3 and 4.0, CP/M 2.209, WordStar 3.0, and manuals.

List price for all of the above based on the MTI catalog is:

Model III plus C/140	\$2959
Winchester/E 7.5	2999
DOSPLUS 4.0	299
CP/M hard disk	
Enhancement	149
CP/M 2.2	no charge
DOSPLUS 3.3	no charge
WordStar 3.0	495
Total System Cost	\$6901

CP/M Compatibility

The thing that sets the C/140 apart from a Model III is the addition of a board that will allow the computer to run under CP/M and an 80 x 24 video display. CP/M is a disk operating system developed by Digital Research Corporation that dates back to 1973. Originally

the operating system was developed for 8080 microcomputer systems. During the past several years CP/M has undergone several revisions and enhancements, and today it is considered to be the "standard" operating system for 8080, 8085 and Z80 based systems.

CP/M and 80 Column Board

Included with the two boards are very good instructions for installing them. The only thing to watch out for is during removal of the Model III's top cover. Make sure that you have plenty of room on the left side and remember that the video wires are very short.

MTI refers to the CP/M board as the Compactor I. This board plugs into the Z80 socket on the Model III's main board. When installed it allows the computer to either run standard TRSDOS type software or CP/M. In the case of the CP/M the Compactor reconfigures memory by removing the Read Only Memory (ROM) from the addressing of the Z80. Next the top 48K of Random Access Memory (RAM) at addresses 4000-FFFF hex are relocated to 0000-BFFF hex. This provides 49151 bytes of RAM for the basic CP/M system to use. Next the video display RAM and keyboard tables are moved from 3800-3FFF hex to F800-FFFF hex. Then the Compactor ROM is loaded into locations C000-CFFF hex. Locations D000-F7FF hex are not used. It is too bad they aren't, as the extra 10239 bytes would be very useful with WordStar.

When the Compactor has finished the above, which takes about two seconds, a sign-on message appears, which indicates the CP/M software was implemented by Hurricane Labs.

The sign-on asks you to either insert a CP/M or TRS disk or press one of the following keys:

D for system diagnostics M for monitor

Break to enter TRS non-disk BASIC.

The diagnostics are a nice feature incorporated into the Compactor. Ten different commands are available.

- 1. An automatic test mode which performs a memory test, video test, checksum test, and a display of characters test. I ran this test for twenty-four hours non-stop and no errors were indicated.
- 2. A test of the Compactor read only memory by use of checksums.
- 3. A drive select, used in conjunction with tests for drive speed.
- 4. Keyboard test to verify that all keys are sending correct values.
- 5. Display the floppy disk controllers registers. This also includes a test of the floppy disk controller.
- 6. A random memory test for the system memory.
- 7. A moving display of the character set across the video.
 - 8. Test of video memory.
- 9. Drive speed test. When used with number three (above) allows you to verify that the drives are running at correct speed. This is a real nice feature and it sure beats paying \$25 for one of the drive speed test software packages.
 - 10. Video character set display,

40 80-U.S. Journal

shows all of the characters available.

If "M" is entered in response to the sign-on message the monitor mode is entered. "L" is a command in the monitor that gives a six-line by thirty-two-character hex display of memory contents. For example, if CE25L is entered while in monitor mode, the hex display and result ASCII code for the start of the sign-on message will be shown on the screen. A "/" command shows the memory contents of the location specified, i.e., 10/ will display the contents of memory location 10 decimal.

CP/M implementation on the MTI C/140 is excellent, except for the limited memory. (After this review was completed MTI announced a new memory board that has a full 64K of RAM.) All of the standard CP/M utilities are supplied. In addition, version 2.209 has some unique files.

First is 80.COM which is used to switch-in the 80 x 24 display. In order to get back to a 64 x 16 display 64.COM is used. CONFIG.COM is a

menu-driven program to modify the drive configuration, i.e., number of tracks, step rate and number of sides. It also will configure the RS-232 port. HFORMAT.COM and HCONFIG.COM are used to format the hard disk and establish the track count, number of surfaces and other parameters needed for setting up the hard disk.

CP/M requires the use of some keys that are not found on a standard Model III keyboard, such as an escape, key, control key, brackets and backslash. Under CP/M the keyboard is remapped to generate these keys. For example, the break key becomes escape, downarrow serves as a control key and shift break becomes a backslash. These changes are documented in the Compactor operating instructions.

Information about the floppys derived from STAT DSK: indicates the following: Each drive has 1520 x 128 bytes or a total of 194560 bytes available to the user. In addition there are two tracks reserved for system use. The minimum block size

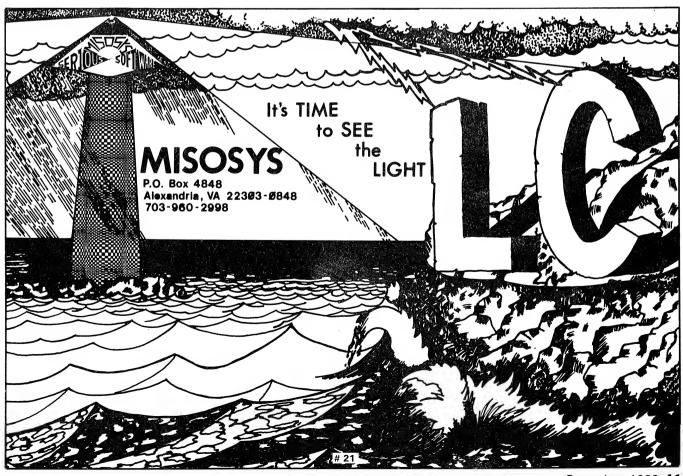
is two kilobytes. This means that the smallest allocation of space on the floppy is 2048 bytes.

CP/M programs are noted for using a lot of disk space, but with the MTI configuration this should not present any problem. The version of WordStar supplied with this machine had on one disk: a 64 x 16 version, an 80 x 24 version, the install program, WordStar example program, and still had 30 kilobytes of free space.

DOSPLUS Hard Disk Operating System

As noted above, a 7.5-megabyte hard disk was supplied as part of the system. As I had requested, this was an external disk, although several different hard disks can be supplied in place of the upper floppy drive.

I first checked out the hard disk using DOSPLUS 4.0. When formatted, the hard disk indicates 7280K bytes of free space. A 5½-inch floppy formatted under the same DOS indicates 180K free bytes. At first blush, it would appear that the hard disk will hold 7280/180 or the



equivalent of 40.44 floppy disks! However, there is a "gotcha" in all of this. The hard disk has 910 grans fo free space. If bytes are divided by number of grans, we see that each gran is eight kilobytes long. This means that the minimum allocation on the hard disk will be 8192 bytes. A program such as Scripsit, which is about 10.5K bytes long, will occupy 16K bytes of space on the hard disk. This is not a problem with the hard disk but is a problem with the DOS-PLUS 4.0 operating system. As noted in the DOSPLUS manual, a five-megabyte disk will have each gran just over 5K bytes long.

Although a great deal of information can be stored on the hard disk, gran size is something that disk manufacturers and disk operating system writers usually don't discuss in their sales literature. When considering purchase of a hard disk, the buyer should look into this to determine if he is really getting the usable space he thinks he is. Another factor is cost per megabyte. The five-mega byte disk by MTI has a list price of \$2499 or \$499 per megabyte. The 7.5-megabyte disk sells for \$2999 list or \$399.86 per megabyte. A ten-megabyte hard disk sold by MTI has a list of \$3499 or \$349.90 per megabyte.

Something that cannot be equated to cost is the incredible speed of a hard disk. A twenty-four-kilobyte program loads instantly. There is no delay. One can really get spoiled with this speed.

A very nice feature of DOSPLUS 4.0 is the ability to place the entire operating system on the hard disk. When this is done, the floppy disk in drive zero is used to boot the computer only. After booting, all commands that normally would be handled by the disk operating system on drive zero are now performed by the system on the hard disk. The difference in speed of the system when it is accessed from the hard disk is awesome.

A problem with DOSPLUS 4.0 is the lack of a wild card for directory or catalog functions. With 200 to 300 programs on a hard disk, locating the name of a particular one from the directory is nearly impossible. (MTI has recently announced a newer version of DOSPLUS (4.0A1) which does have a wild card feature and a command called ACAT, which gives an alphabetical listing.)

CP/M Hard Disk Operating System

The HCONFIG program provided with the evaluation machine was evidently preset for a five-megabyte hard disk. At any rate, when I ran it, no prompts appeared and control was returned in a second or two. I formatted the hard disk using HFORMAT.COM, which resulted in an indication that the disk had been formatted so that 4864K of space was available. I do not know if HCONFIG was supposed to ask for hard disk parameters or not.

If this had been a five-megabyte hard disk, the following parameters would apply. The directory would hold 512 entries and minimum disk allocation space would be 8K bytes, the same as for DOSPLUS. In the case of CP/M, this rather large size would not present the same problem as under DOSPLUS, due to the large size of most CP/M application files. For example, WordStar is about 16K bytes long and requires two overlay files, one of 28K, the other of 34K bytes.

It is a joy using WordStar with the C/140 and a hard disk. Due to the limited memory in the C/140, using WordStar with floppy disks is not very effective. A disk I/O will occur after every few lines of text, either during text entry or scrolling. When WordStar is used with the hard disk, there is *no* apparent disk I/O! It happens so fast that it is impossible to tell when a disk access has been done.

Video Problems

The computer supplied for evaluation suffered from two problems associated with the video display. First, the display was just not sharp, compared to my Model III. Horizontal components of the characters exhibited noticeable blooming and the single-dot components were very fuzzy. Attempting to use the 80 x 24 column display was very hard on the eyes. Similar models in the MTI showroom did not exhibit this problem, so I guess the focus had not been properly set prior to shipment. The second problem was the noticeable video movement that occurred during floppy disk activity. Either the power supply was marginal in capacity or inadequate filtering had been used. A computer with this much potential deserves a better video. After this article was prepared, MTI announced that a P31 green phosphor tube could be installed for an additional charge.

Heat Buildup

Something that always concerns me with the addition of internal accessories is a build up of heat due to the extra load. When I first brought the C/140 in for evaluation. I set it up next to a stock Model III equipped with two drives. I inserted matched thermometers into the number one drive of each machine and turned them both on. After a little over an hour, the stock Model III indicated 38 degrees C, and the C/140 was 40 degrees C. Evidently, MTI has done a very good job handling extra heat generated by the two additional boards.

The MTI C/140 is a powerful computer, or perhaps it should be called a powerful pair of computers. It is really two computers in one. CP/M has been implemented quite well in this machine. There is one rather strong drawback. There is just not enough memory (45K) to run many CP/M programs. MTI should have an additional memory board for the C/140 by the time this article is published.

Another thing that is really needed with the C/140 is a terminal program used with the RS-232 port to allow transfer of programs from another computer. The disk format used by the C/140 is not CP/M standard and there is no assurance that all of the software a buyer might want is available in this format. In fairness to MTI, is should be noted that there is no standard disk format for the 5½-inch floppy disk.

DOSPLUS 3.3 is supplied with the C/140 at no charge. I would think that DOSPLUS 3.4 would be a better choice. It has several useful features not included in 3.3. I tried DOSPLUS 3.3 and 3.4, TRSDOS 1.3, NEWDOS/80 and LDOS with the MTI C/140, and all worked fine. However, using the hard disk does require DOSPLUS 4.0 or a driver for

NEWDOS or LDOS.

A very useful addition to the software packaged with the C/140 would be an alteration of DOSPLUS and CP/M to allow them to share a hard disk. For example, DOSPLUS could, perhaps, format one-half of the disk and CP/M the other half. Another useful software package would be a utility that allowed the transfer of TRSDOS files to CP/M and vice versa. Omikron has a very nice utility supplied with their CP/M board to convert TRSDOS files, and Misosys supplies a very versatile utility for converting a CP/M file over to LDOS. Due to different CP/M formats involved. neither of these programs will work with the MTI version of CP/M.

During the testing of the C/140, I plugged it into a wall outlet that is unusable with my own computers because of voltage fluctuations. I did not experience any low voltage problems with the computer or the hard disk. The only time I turned the power off on either device for the first couple of weeks was when it was necessary to move them to

different parts of the room. Turning the hard disk on or off while the computer was running, and turning the computer off while the hard disk was on, did not have any effect. I went to a fair amount of trouble trying to get one or the other to malfunction but without success. I never did have any rebooting or random resets with the C/140 during the month I had it for evaluation. The C/140 and its hard disk are rock solid.

The only real problem I had with the C/140 during evaluation was trying to figure out some way to convince MTI that I should be allowed to keep the hard disk for a couple of years for an extended test. By now, you should be aware that I have flipped over the 7.5-megabyte and the disk I/O speed.

Looking back at the list price of the C/140, in the configuration I tested, raises the question, "Is it worth it?" It is true that \$6901 is a lot of money, but the C/140 and 7.5megabyte hard disk make for a lot of computing power. A stock Model III with 48K of memory and two disk drives sells for about \$2200. A bottom-end CP/M system with two drives would cost at least \$3000. Current prices for a 7.5-megabyte hard disk may be as low as \$2600. A two-computer setup similar to the CP/M would sell for about \$7800 plus software — at least \$900 more than the MTI.

Ed. note: Mr. Avant's article was sent to MTI for comment. Here is their response.

Dear Mr. Avant:

I appreciate the opportunity to review your evaluation of the system we lent you. I would like to take advantage of this opportunity to address several points in your article. I shall attempt to itemize these by area within your article for reference purposes.

Overview

Our instructions give details for using the 80 x 24 board with DOSPLUS only, not with a TRSDOS-type operating system. It is important that the user understand that this board will only operate with CP/M automatically,



or DOSPLUS if addressed. We do not support *any* other operating system. The system supplied contained DOSPLUS 3.4 and DOSPLUS 4.0A. These distinctions are important, as we will see later in the area of examining the operating system itself.

CP/M and 80-Col. Board

The version you would see on the screen at bootup is 2.2, if you insert a CP/M diskette. The version 1.0 visible on the screen refers to the compactor. Perhaps clearer documentation is needed.

DOSPLUS Hard Disk Operating System

The version of this system you had was 4.0A. Since the time of this evaluation, a new version has come out known as 4.0A1. This version allows one to partition the disks into pseudo drives. This is a fine feature in several respects. It allows you to backup one-half of the disk to the other half. Secondly (we have not thoroughly tested this), it appears that we can, by partitioning, run both CP/M and DOSPLUS on the same disk. An additional feature is the ACAT command, which gives you an alphabetical listing of the directory (very useful when you have one hundred or more entries). The ACAT command also allows you to use wild cards in sorting.

As far as the allocation of grans and the size of the bytes per gran,

although I do not pretend to be a programmer, I do know that when all else fails... read the instructions. They do contain the necessary elements to change the CONFIG to allocate different bytes per gran and different grans per track. I do know that you cannot allocate a specific number of bytes, but you can limit the problem that you are addressing.

Video Problems

The video monitor is a standard Radio Shack monitor and they do have variations inherent in design and manufacture. As I demonstrated to you when you returned the machine, there is a focus control on the video board that simply requires turning a trim pot to sharpen the screen. The 80 x 24 board has no effect on the video, other than a general shrinking of the horizontal format size in order to allow for the number of lines (twenty-four) involved. We do realize that a problem exists with the large power supply we use in this machine, but corrections are on the way. Our engineering department has determined the difficulty and has worked with the manufacturer to correct this problem. Future versions should not show the movement that you refer to.

We do have available catalog #1316 green CRT and catalog #1315 white cabinet as extra cost options for anyone who wishes to dress up his machine.

All of our dealers are required to purchase a service kit. Two of the items in this kit are the CP/M transfer diskettes (Model II and Model III) and the CP/M transfer cable to link the two machines together.

In regard to standard format, the new CX machine, containing 64K RAM, etc., which we just introduced at Comdex Spring, contains the following formats for drive one, all of which are operator selectable: Xerox, Osborn, Cromemco, Omikron, Lifeboat and Eagle.

We are developing other standard formats at present and will also have these available to run on the 48K version. DOSPLUS 3.3 is provided because we have a license agreement to use it and for the average end-user it is a better DOS. We do have an optional upgrade to 3.4 if desired.

I hope that these comments have corrected some of the shortcomings you may have felt were existent in our machine. MTI is proud of its products and values its good name. We will do what is necessary to make our many customers happy. Thank you for the time and effort you put in on this article.

Sincerely,

Paul S. Gans

Director of Marketing, Microcomputer Technology, Inc., 3304 W. MacArthur, Santa Ana, CA 92704, (714) 979-9923, TWX 910-595-1902 MTISNA ■

TRS-80 Models I & III

Business:

DANCE\$100.00

Build a computer business out of your own home! This program matches people attending a local school or social dance based upon statistical analysis of their answers to a questionairre. Prints tickets to the dance with matches printed on them. Recover the price of the program in just one dance!

CHECK\$75.00

Keeps track of your disbursements. Stores a Check Number, Date, Payee, Amount, and Code Number for up to 2600 checks.

ONE STOP SOFTWARE

Utilities:

SUPERDRAW\$30.00

Helps design your applications' Graphics & Text Screens. Allows cursor-controlled graphics/text design including automatic commands for drawing lines, boxes (with or without Fill), circles, and ellipses (X-Semimajor, or Y-Semimajor). Includes reflection on X or Y axis and overlay. Saves Screens as Data Files or BASIC Data Statements to be merged later.

MDZAP\$20.00

Multi-Density ZAP. Corrects disk errors on either Single or Double Density disks. Includes HEX or ASCII Modification, selectable step rate for mixed-drive systems, reformat Sector Not Found Errors without losing valuable data. Model I only.

P.O. Box 892-600, Tarzana, CA 91356



Christmas Card

```
10 CLS
                                            500 FOR X=90 TO 104
20 FOR X=0 TO 127
                                            510 SET(X, 4): SET(X,7)
30 SET(X, 0):SET (X,47)
                                            520 NEXT
40 NEXT
                                            530 PRINT @ 612, "TO:" @ 678, "Y O U";@ 33
50 FOR Y=1 TO 46
                                            7,"HANDLE WITH CARE"; @ 401,
60 SET(0, Y):SET (127,Y)
                                            "CHRISTMAS CARD ENCLOS
70 NEXT
                                             E D"; :PRINT@862, "PRESS <ENTER> TO OPEN"
80 FOR X=108 TO 124
90 SET(X, 2):SET (X,11)
                                            540 IF INKEY$ ="" THEN 540
100 NEXT
                                            550 CLS
110 FOR Y=3 TO 10
                                            560 F=-1
120 SET(108, Y): SET (109, Y)
                                            570 L=7
130 SET(123, Y): SET (124,Y)
                                            580 PRINT"FROM BOB, CAM, CATHY, DON, EVA
140 NEXT
                                            , KRISTI,"
150 FOR X=109 TO 124 STEP 3
                                            590 PRINT"MIKE, SHERRY, JIM, SPENCER, TE
160 SET(X-1, 12)
                                            RRY"
170 NEXT
                                            600 READ A
180 FOR Y=3 TO 11 STEP 2
                                            610 IF A=-2 THEN L=L+1: X=18: GOTO 600
190 SET(107, Y):SET(125,Y-1)
                                            620 IF A=-1 THEN 700
200 NEXT
                                            630 IF F=-1 THEN X=X+A ELSE FOR X1=X TO
210 PRINT @ 122,"15";
                                            X+A-1: SET(X1, L): NEXT: X=X+A
220 POKE 15484, 67
                                            64Ø F=-F
230 POKE 15479, 168
                                            650 GOTO 600
240 POKE 15480, 172
                                            660 DATA-2, 23, 1,-2, 22, 2, 1, 1, 10, 1
250 POKE 15481, 180
                                            ,-2, 22, 3, 8, 1, 1, 2,-2, 23, 2, 8, 3,-
260 PRINT @ 184, CHR$(174)CHR$(187)CHR$(
                                            2, 23, 1, 9, 2, 2, 1,-2, 23, 1, 1, 1, 6,
187)CHR$(189);
                                             2, 1, 2,-2, 22, 1, 1, 1, 6, 2,-2, 25, 1
270 FOR X=113 TO 118
                                            1, 2, 1, 2, -2, 22, 13, -2, 23, 11, 50,
280 SET(X, 9)
                                            1,-2, 26, 5, 22, 2, 28, 2,-2, 26, 5, 21,
290 NEXT
                                             2, 27, 5,-2, 27, 3
300 FOR X=115 TO 117
                                            665 DATA 21,3,28,4,-2,28,3,13,4,2,2,28,8
310 SET(X, 10)
                                            670 DATA-2, 28, 4, 3, 16, 30, 6,-2, 5, 1
320 NEXT
                                            , 22, 24, 26, 8, -2, 4, 4, 19, 24, 3, 2,
330 PRINT @ 68, "THE REINDEER" @ 132, "% 8
                                            21, 12,-2
Ø-US JOURNAL"; @ 198, "TACOMA, WA";
                                            680 DATA 3, 4, 20, 30, 22, 8,-2, 4, 6, 1
340 PRINT @ 780, "AIR MAIL";
                                            6, 19, 2, 5, 5, 2, 16, 13, -2, 2, 7, 15,
350 FOR X=24 TO 39
                                            13, 10, 9, 3, 2, 17, 8, -2, 0, 12, 9, 3,
360 SET(X, 39)
                                            3, 6, 15, 2, 6, 2, 16, 15, -2, 3, 5, 12,
370 NEXT
                                       . 1, 5, 5, 27, 1, 22, 2, -2, 1, 10, 9, 1, 3
380 FOR X=78 TO 85
                                            , 3, 32, 1, 21, 2,-2, Ø, 12, 7, 2, 2, 2,
390 SET(X, 3)
                                            34, 2, 20, 2, 2, 5
400 NEXT
410 SET(86, 4): SET (87,4)
                                        690 DATA 6, 11,-2, 5, 2, 13, 5,-2, 5, 2,
420 SET(88, 5): SET (88,6)
                                           5, 8, -2, 4, 8, -2, \emptyset, 4, -1
430 SET(87, 7)
                                            700 PRINT @ 913, "MERRY CHRIST
440 FOR X=86 TO 78 STEP -1
                                             MAS"
450 SET(X, 8)
                                            71Ø X=45:Y=17
460 NEXT
                                            720 FORB=1TO100:FORC=1TO30:RESET(X,Y):RE
47Ø SET(77, 7): SET(76,7)
                                            SET(X+2,Y):NEXTC:SET(X,Y):SET(X+2,Y):FOR
48Ø SET(76, 6):SET(76,5)
                                            D=1TO30:NEXTD:NEXTB
490 SET(77, 4)
                                            730 GOTO 720
```

MULTIDOS

An extremely versatile operating system

Model I/III, PMC-80, LNW80

Terry Kepner, Peterborough, NH

Cosmopolitan Electronics Corporation (P.O. Box 234, Plymouth, MI 48170 (313) 397-3126) has recently released MULTIDOS for the Model I and III, retailing for only \$99.95.

MULTIDOS is unique in that it can read and write all density disks, with only one exception. That is, if you have a double-density board, such as Percom's, you can read or write files in double-density mode and make backups of them, no matter whose double-density DOS you originally used. This is also true of single-density disks. The exception is that NEWDOS/80 disks can only be read, and NEWDOS/80, version 1.0, can be backed up only if the directory is exactly two granules in length. NEWDOS/80 version 2.0, for the Model III, cannot be backed up. If you want to use double-density disks on drive zero, you should order MULTIDOS on a double-density disk. MULTIDOS can read, write, or copy to and from, several Model III DOS diskettes (unfortunately, there is a problem in writing to NEWDOS/80 or TRSDOS).

You can control the number of tracks being used on the disk. For example, if your drives are 80-tracks, just backup the MULTIDOS disk from a 35-track drive to an 80-track drive. Voila, you have an 80-track DOS.

Outside of these unusual capabilities, MULTIDOS is quite similar to TRSDOS. Most of the library commands are similar to TRSDOS, but there are some new ones. You can perform a software computer reset, disable the BREAK

key, create and substitute a disk file for keyboard input (commonly called a DO file), set to zero all RAM locations from location 5200H to top of memory, or from 4000H to top of memory. You can customize the power-up stepping speed and density default values for the disk drives, set printer parameters (line width, lines per page, lines printed per page, and line spacing), set default conditions of the keyboard (lowercase and graphics drivers, repeating keyboard, CLEAR key disable, blinking cursor), and the character used for the cursor can be altered. You may link the printer to the video display, or vice versa (anything sent to one goes to both), redirect printer output to the video or vice versa, and reserve high memory in DOS for programs and/or data. (Whew!)

MULTIDOS's system utilities include the standard three (backup, copy and format), adapted to multiple track and single or double density operation, plus these other utilities:

- 1) Radio Shack's tape-based editor/assembler, as adapted by Apparat for disk I/O, and further adapted by CEC to MULTIDOS, adds (among other things) commands to view the directory and to copy or kill files. Because CEC didn't write this utility, documentation is supplied only for the commands that were added.
- 2) A graphics utility which uses the keyboard to generate graphics characters with single keystrokes.
- 3) A utility to locate one- or twobyte machine language codes in

memory.

- 4) A print-spooler which lets the computer operate at full speed without waiting for the printer to finish printing each line of data.
- 5) A "master" disk file manipulator, that copies files in batches, performs batch file purges, prints the disk directory (just the right size to tape to the diskette's envelope), and executes a program. Protection attributes in the directory are ignored, so you can use VFU to copy any file, which provides a handy method of customizing your DOS.

There are actually two versions of BASIC on the MULTIDOS diskette. The first is SUPERBASIC, which gives you "single keystroke commands" and "single letter commands" (a total of fourteen commands).

In addition, via the command CMD" ", you have access to more functions. Obtain automatic program space and linefeed elimination, (if they are not in quoted text), data statements, or REM statements. Redisplay the last disk I/O error code message. Zero arrays or delete them. Duplicate lines and move them. Open an additional disk file buffer from BASIC. You have a built-in machine language sort and a listing of all the scalar variables used by your program. There is the ability to transfer the resident disk BASIC program down to Level II BASIC, execute or edit it, and return to disk BASIC with the program and variables intact. This feature will be indispensable for people who

46 80-U.S. Journal

develop software for Level II machines. You can execute any MULTIDOS function from SUPERBASIC, including SUPERBASIC, again.

You also get global ASCII character search through your program. Global mass editing of your program gives you these abilities: search and replace, merging of adjacent lines, splitting one line into two lines, and converting a CHR\$(y) into a graphics string. You can obtain cross-references of variables, reserved words (BASIC), and integers to the line numbers that they are on. Program renumbering and emergency recovery of programs accidentally deleted with the NEW command are possible. You can load and execute a program without clearing out the previous program's variable values. This lets you chain programs, one after the other, into the computer without having to reenter information.

The other BASIC, called BBASIC, supports all of the features of SUPERBASIC, plus powerful TRACE features. You can single step each instruction, single step each BASIC line, single step with times wait, trace to video, trace to the printer, and review the values of selected variables on demand. These features can be turned on and off from within your programs.

The eighty-five-page manual is not for the beginner. It is thorough, but assumes that the reader is familiar with operating systems and their commands.

MULTIDOS supports data files with logical record lengths other than 1 and 256. This eliminates the need for subrecords, or wasted disk space.

MULTIDOS is a powerful system for developing BASIC programs. To my knowledge, no other DOS supplies a BASIC with so many helpful features for the programmer.

MULTIDOS has just been released in an upgraded version that now includes utilities such as Easy Zap, TAPE/CMD for conversion of machine language to disk, and DDT/CMD for disk drive timing.—Ed.

70 INCOME TAX PROGRAMS

(For Filing by April 15, 1983)
For TRS-80* Models I and III

FEATURES:-

- 1. Menu Driven.
- 2. 70 + Tax Programs.
- 3. Basic; Unlocked; Listable.
- 4. Name/SS No./FS carried over.
- 5. Inputs can be checked.
- 6. Inputs can be changed.
- 7. I.R.S. approved REVPROC format.
- 8. Prints entire Form/Schedule.
- 9. Calculates Taxes, etc.
- 10. On std. 35-track, Mod. I format disk.
- 11. CONVERT for Model III.
- 12. Use GREENBAR in triplicate
 don't change paper all
 season!
- 13. Our 4th Year in Tax Programs.
- 14. We back up our Programs!

Helpful programs to calculate and print the many Tax Forms and Schedules. Ideal for the Tax Preparer, C.P.A. and Individual. For just \$24.75 per disk, post-paid (approx. 60 grans per format disk).

Programs are designed for easy-use, with checkpoints to correct parts as needed. Results on screen for checking before printing.

In all, there are more than 70 individual Tax Programs. These include Form 1040, 1040A, 1040EZ, 1120, 1120S, 1041 and 1065. Also Schedules A, B, C, D, E, F, G, R, RP and SE. And, Forms 1116, 2106, 2119, 2210, 2440, 3468, 3903, 4255, 4562, 4797, 4835, 4972, 5695, 6251 and 6252.

And, we have a disk we call "THE TAX PREPARER'S HELPER" which has programs for INCOME STATE-MENTS, RENTAL STATEMENTS, SUPPORTING STATE-MENTS, IRA, ACRS, 1040/ES, ADD W-2's and PRINT W-2's.

TRY ONE DISK AND SEE FOR YOURSELF. ONLY \$24,75 POSTPAID.

First disk is TR#1, and includes Form 1040 and Schedules A, B, C, D and G. \$24.75 POSTPAID.

Write:-



GOOTH TAX PROGRAMS 931 So. Bemiston • St. Louis, Mo. 63105

VISA

*T.M.Reg. by Tandy Corp. Ft. Worth, Tx.

NEW TRS-80* PROGRAM LETS YOU CHART STOCKS LIKE A WALL STREET PRO.

The Wall Street TAP is a powerful, professional stock market trading tool. It employs the same charting methods used by successful market experts to buy, sell and hold stocks.

Now, you can make these time-sensitive decisions yourself and make more money on the market.

Point and figure, moving average and on balance volume charts are at your fingertips to spot trends and compare the performance of two stocks instantly.

Easy to use, the Wall Street TAP is self-documented, user

Easy to use, the Wall Street TAP is self-documented, user friendly, self-prompting with virtual error-free entry and batch updating. You need a TRS-80 Model I or III 48K and 1 disk drive. *TRS-80 is a trademark of Tandy Corp

WALL TOP

* Technical Analysis Package.

			• 🏈	(
•	_			
		•	9	
	(

24

27.20 M

Chart Stocks, Commodities & Currencies 3 Ways.

FOR MORE PROFIT & BIGGER GAINS ORDER YOUR WALL STREET TAP TODAY!

- ☐ Yes. I want to start charting stocks on my TRS-80 today. Please send my Wall Street TAP tape immediately. US \$199.95 is enclosed. I understand postage, handling, documentation, sample printouts, help desk support.
- ☐ Send documentation only. US \$29.95 plus \$2 postage and handling. (\$29.95 refundable if you purchase package later.)

ies o ways.			
Name			
Address			
		Śtate/Zip	
Payment \$	□ Check □ Visa	☐ Money Order☐ MasterCard	U 2
Card No			
Expiry	Signature		
572 - 810 W. Broa	idway, Vand ie For Faste s (604) 261	nk Software Inc., couver, B.C. Canac er Delivery. Card u -7261. Dealer	la sers

USRful patch

Have unlimited USR calls

Model I/III, PMC-80, LNW80, no disks

Charles C. Edwards, Jacksonville, FL

Faster than a speeding GOSUB, more powerful than a Shell sort, able to leap through K of RAM in a single JP. Is it BASIC? Is it TRSDOS? No, it's assembly language. However, those of us who have tried to merge machine code with our BASIC programs have had to face the annoyance of having only one USR call available in Level II BASIC. Have you long envied those disk owners with their ten USR calls? Well, this article will describe an extremely small (twelve bytes) enhancement to Level II which will provide an unlimited number of USR calls. As a bonus, you will no longer have to POKE the address of your subroutine into memory before calling it.

First, let's examine how disk systems manage to implement their ten USR calls, and we will see how we can use the same method to our advantage. When the Level II interpreter encounters the token "USR," it branches to ROM address 27FEH to begin processing the statement. Once there, the first thing it does is call address 41A9H. Under Level II, this location contains a RET instruction, so we simply return to the caller and continue processing. Most DOSs alter this into a jump instruction, which transfers control to a piece of code in the DOS, which implements the multiple USR calls.

For this reason, 41A9H is called a "DOS." That is just a fancy way of saying that this is a point at which ROM processing can be intercepted in order to change the normal flow of logic. Well, if a DOS can intercept the interpreter at this point, so can we! Listing 1 is the complete patch which will implement infinite USR calls.

Listing !

41A9		JP	USR	;BRANCH TO THE PATCH
	USR	CALL	1E5BH	;GET THE ADDRESS, IF ANY
		DEC	$^{ m HL}$;BACK UP POINTER
		LD	A,D	;SEE IF ADDRESS IS ZERO
		OR	\mathbf{E}	
		RET	Z	;USR CALL WITH NO ADDRESS
		LD	$(408\mathrm{EH}),\mathrm{DE}$;STORE THE ADDRESS
		RET		;BACK TO BASIC

You will notice that, with the exception of address 41A9, I have not provided any addresses with the listing. I did this to emphasize the fact that this code is completely relocatable. You can put it at the top of memory, or after any other routines (printer driver, etc.)

which you normally load. After loading this, you can invoke a machine language subroutine by entering, in BASIC: X=USRn(Y), where n is the address (in decimal) of the routine. For example, a common BASIC subroutine suspends processing until a key is depressed.

Listing 2 shows two methods of doing this. The first example is the typical BASIC coding. The second uses a ROM routine at decimal 73 (hex 49) to wait for a key to be hit. Of course, we don't know which key was pressed, as we do with INKEY\$. For the purposes of the example, we are assuming that we don't care.

Listing 2

- 1 REM THIS IS HOW WE WOULD NORMALLY DELAY IN BASIC
- 10 PRINT "HIT ANY KEY TO CONTINUE": GOSUB 200
- 200 I\$=INKEY\$:IF I\$="" THEN 200 ELSE RETURN \cdot
- 1 REM THIS IS HOW TO DO IT USING A ROM ROUTINE
- 10 PRINT "HIT ANY KEY TO CONTINUE" :X=USR73(Y)

Let's look at Listing 1 in detail. After intercepting the interpreter at the beginning of USR processing, the HL register points at the byte OC1H, which is the internal representation of the token "USR" in Level II. We call the ROM routine at 1E5BH, which will convert the ASCII number following the USR command into the binary equivalent and return the result in the DE register. If the number is omitted, the DE register will contain zero. A side effect of this routine is that HL will now point to the character following the address, which should be the "(." So, the next thing we must do is back up HL to the preceding character.

We must check if the result in DE is zero. If so, we will return to USR processing and resume the normal program flow. Otherwise, we load 408EH with the address specified and return to the ROM routine. 408EH is the location where the address of the USR routine is normally POKEd. This will cause us to branch to that

location.

The beauty of this routine is that it retains the ability to pass a parameter to the subroutine. Other published methods to implement multiple USR calls usually use the parameter to pass the address of the routine to be called, whereas, my method is much easier to implement. I am surprised that it is not standard practice in most DOSs. For those of you without assembler, Listing 3 is a short BASIC program which will POKE this routine into memory for you. Simply change the value of "I" in line 10 to point to the address at which you want the code to begin.

Listing 3

- 10 I=65524:I1%=I/256:I2%=I-I1%*256
- 20 POKE 16809, 195:POKE 16810,I2%:POKE 16811,I1%
- 30 FOR J=I TO I+11:READ X:POKE J+65536*(J>327 67),X:NEXT
- 40 DATA 205,91,30,43,122,179,200,237,83,142,64,201

The next time your friend with his fancy-schmancy disk drive brags about all of the great features his DOS gives him, you can knock his socks off with more USR calls than he can shake a diskette at!



The B.T. Enterprises COMPUTER CONNECTION New Toll Free Order Number

Upgrade Kit

Putting Disk drives into your TRS-80 Model III will turn it into the powerful computer it was designed to be. The B.T. Enterprises DISK DRIVE INSTALLATION KIT is easy to do and represents a substantial savings over the cost if done by Radio Shack.

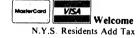
The kit was designed to be installed by a non-technical person, and takes an average of 45 to 75 minutes to complete. The only tools necessary are a phillips and flat head screw driver and a pair of diagonal cutters. No cutting of traces or soldering is necessary. The full instruction procedure was the topic of a feature in 80 US Magazine in the May, 1982 issue, and was given high marks for ease of installation.

KIT CONSISTS OF:

- FDC III B* Micromainframe Controller Board assembled & tested
- Switching power supply
- Disk drive mounting brackets
- All cables and hardware
- Instructions with diagrams
- Drives are optional
- *FDC III C Board optional at additional cost supports 8 inch external drives and extended density 5-1/4 inch drives (dual headed and 80 track)

203103	Disk Upgrade Kit B Version		
	w/ hardware	\$279.95	
203104	Disk Upgrade Kit C Version		
	w/ hardware	\$309.95	
203113	Disk Upgrade B. Version		
	w/2 40tk & 32K	\$799.95	
203114	Disk Upgrade C Version		
	w/2 40tk & 32K	\$829.95	
203115	Disk Upgrade C Version		
	w/2 40tk DH & 32K	\$1029.95	ó
203118	Disk Upgrade C. Version		ō
	w/2 80tk & 32K	\$1029.95	>
203117	Disk Upgrade C Version		ģ
	w/2 80tk DH & 32K	\$1229.95	۳
203003	FDC III B Controller Board		the
	Only	\$139.95	ō
203004	FDC III C Controller Board		¥
	only	\$169.95	Ĕ
200500	Switching Power Supply		ade
	(3 voltages)	\$99.95	=
203010	Controller Assembly Kit	\$75.00	S
203510	Controller Assy kit		8
	w/power Supply	\$174.95	IRS-80 is a trademark of the Tandy Corp
DH - 1	Dual Headed		Ė

Add \$2.00 Shipping and Handling Dealer Inquires Welcome Prices Subject to Change



26



B.T. Enterprises
Dept. 8L
10B Carlough Rd.
Bohemia, N.Y. 11716
800 645 1165 (orders only)
N.Y.S. Residents Call
516 567 8155
516 588 5836 (modem)

Driver education

Using device control blocks and drivers

Model I/III, PMC-80, LNW80

Bob Bowker, Los Angeles, CA

With the availability of several new DOSs on the market for the TRS-80 Models I and III, the subject of "compatibility" has become an important one: Will my TRSDOS programs run with LDOS, NEWDOS/80 or one of the others?

In the case of most application programs — accounting, database management, etc., whether BASIC or machine language — the answer is *yes*, as the new DOSs have, in general, tried to be upward compatible with TRSDOS.

"Upward compatible" is one of those buzzwords which too often get in the way; it simply means that TRSDOS programs should run on the new DOS, but programs written with the new DOS won't necessarily run on TRSDOS. None of this means that the DOSs are compatible with each other — for example, there's no guarantee that a BASIC program written on NEWDOS/80 will run on LDOS, or vice versa.

The fact that many programs will run with few changes (if any) on another DOS is due in no small part to the willingness of the new system authors to respect Randy Cook's format in the communications region. Starting with TRSDOS 1.0 on the Model I, the RAM from 4000H to 4200H was set aside for pointers, vectors and storage areas, which have been largely maintained in the versions of TRSDOS released since, and in the new DOSs.

The first twenty-one bytes from 4000H to 4014H are vectors for seven RST instructions. For example, when the Z80 encounters an RST 28H, control is transferred first to 0028H in the ROM, where a JUMP 400CH vectors the program into the DOS communications area. There, another JUMP will vector the

program to the DOS code which will execute the RST 40H comands. In the absence of a DOS, there will be a RET instruction at 400CH, sending control back to the ROM to handle things.

The next twenty-four bytes, from 4015H to 402CH, make up the DEVICE CONTROL BLOCKS—in effect, they contain all the information anyone needs to know about the keyboard, display and printer. Each of these devices is assigned an eight-byte block of RAM in which to store various codes, addresses and parameters. All of the DCBs are constructed as follows:

Rel Byte

- 0 Device Type
- 1. LSB of Driver Address
- 2 MSB of Driver Address
- 3 Device Parameter Storage byte 1
- 4 Device Parameter Storage byte 2
- 5 Device Parameter Storage byte 3
- 6 Device Name byte #1
- 7 Device Name byte #2

This format is followed in TRSDOS 1.0 through 2.3B, NEWDOS+, NEWDOS/80, LDOS, DOSPLUS, and so on: they make a very necessary contribution to compatibility.

The three DCBs for the keyboard, display and printer are maintained in the communications region at these addresses:

Keyboard DCB ... 4015H-401CH Display DCB 401DH-4024H Printer DCB 4025H-402CH

Device Type

The first byte of every DCB is a flag which defines the directions of communication which that device supports. Only three of the eight bits available in this one byte are used consistently by all DOSs: if bit two is set, the device is capable of handling requests containing control codes; if bit one is set, the computer can get information *from* the device; and if bit zero is set, the computer can send data *to* the device.

This is really not as complex as it sounds. For example, the keyboard: the computer can get data from it—that happens every time you hit a key—but the computer can't send either control codes or data to the keyboard, since that would be fruitless. Thus, the device type for the keyboard is 0000 0001, or 01H.

Similarly, the display can handle control code requests (set bit two), the computer can send data *to* it (set bit one), and can receive data back *from* it (set bit zero). Thus, its type code is 0000 0111, or 07H. A line printer's type code is 06H, since it's capable of two-way communications with the computer but can't handle control code requests.

The rest of the bits in this device type flag are used for other parameters by LDOS, for instance, but there's no standard for them among all systems. Of all the systems on the market today, LDOS seems to be the most advanced; it carries the DCB concept to extremes, assigning one each to any number of devices, all of which are user-definable. In LDOS, we're finally seeing Randy Cook's ideas working properly, and well.

Driver Address

Relative bytes one and two of

50 80-U.S. Journal

every DCB contain the address of the device's driver, in standard Z80 reverse notation. A driver is really nothing more than the subroutine which controls that device. A driver for each of the three devices is provided in ROM:

Keyboard Driver 03E3H-0457H Display Driver 0458H-058CH Printer Driver 058DH-05D8H

Each of the devices is handled by using its driver subroutine. For instance, to send a byte to the printer, load it in the C register and CALL 058DH.

This is the opening we need to customize the TRS-80 — write your own driver, or portions of one, and stuff that address in the DCB of the appropriate device. When an operation uses that device, your routine will be in control. This way, you can change all zeroes going to the printer into slash/zeroes, or add a linefeed to every carriage return, or activate the lowercase characters in

the Model I, or convert your "QWERTY" keyboard into a "DVORAK" keyboard, and so on — the possibilities are endless.

Let's take one example, converting all zeroes headed for the printer into slash/zeroes. This one is simple — you don't have to write a complete driver, just intercept all printer commands to check for a zero. Should the character about to be printed not be a zero, send the program on its way to the existing driver and hardly a step has been missed. If it is a zero, however, we'll go to work ourselves. The code in Listing 1 will do just that.

Step 1: The contents of the C register are transferred to the A register to be compared with 30H (hex for 0); if it's anything else, the Z flag will not be set, and a JUMP will take place to the LPRDVR: carry on, folks. However, if it is a zero, the Z flag will be set, and the JP will not take place.

Step 2: Print the zero, but don't give up control yet: make sure the LPRDVR returns things to us and

not to the caller. We can do that by CALLing the LPRDVR ourselves.

Step 3: Once the zero is on paper, we have to move the print head back one space, to "overstrike" the slash. If we were to try to use LPRDVR to do this, we'd be in trouble: the ROM printer routine ignores such control codes by masking them out (remember the printer device type—06H means no control code requests can be handled). So we'll have to bypass LPRDVR and do the backspace ourselves, by loading the 08H directly into the printer's niemory mapped location.

Step 4: All that's left is to print the slash itself, which we load in the C register. Since we're finished now, we'll let LPRDVR take it away this time — we JUMP to it, and when in turn it's done, control will be passed back to the original program.

We now have a "trap," but we need to set it in place, and activate it. Since the system already has a LPRDVR, and not necessarily ROM's driver, we'll need to incorporate the existing address in

DISCOUNT COMPUTERS

100% RS COMPONENTS, NO FOREIGN DRIVES OR MEMORY — FULL WARRANTY

16K COLOR COMPUTER 427.00	DMP-500 PRINTER
32K COLOR COMPUTER497.00	DMP-100 PRINTER 299.00
16K MODEL III	DMP-200 PRINTER 599.00
48K MODEL III, 1 DR 1549.00	DWP-410 DAISY 1195.00
48K MODEL III, 2 DR. RS2321795.00	DAISY WHEEL II 1599.00
64K MODEL II, 1 DR2499.00	1 DR. EXPANSION MODEL II 919.00
128K MODEL 16, 1 DR 3898.00	8.4 MEG HD. DISK MODEL II/16. 3599.00
128K MODEL 16, 2 DR 4510.00	ALL RS SOFTWARE20% OFF

27

CASHIERS CHECK OR MONEY ORDER MUST ACCOMPANY ALL ORDERS.

(817) 825-4027

NOCONA ELECTRONICS • Box 593 • Nocona, TX 76255

our program. Also, to be really professional about this, we should relocate our subroutine into high memory, and protect it.

The first thing INIT does is get the current LPRDVR address, and load it into our code at the three spots we use it. Next, the address of the first available location in upper memory is loaded into DE (the DEstination). HL is loaded with the address of the last byte in our code, and BC (the ByteCount) is loaded with the length of our code. The command LDDR moves those bytes, one at a time, in reverse order.

The next task is to "protect" our code. The LDDR instruction leaves DE pointing to the location just ahead of our code, so storing that address in 4049H, the high memory pointer, will do the trick. Bump DE to point to the first actual byte of our code, store it in the printer's DCB, and we're done.

Parameter Storage

The three bytes in the middle of each DCB are available to the driver

to store various parameters, values, counters, etc. In the case of the printer DCB, for instance, parameter byte one contains the number of lines per page, and byte two has the current line number.

In passing: this explains why in many cases the printer, under TRSDOS, will "creep" down the page, starting each page one line lower than the previous page: TRSDOS initializes the printer DCB byte #3 to sixty-seven lines per page, when eleven-inch paper allows only sixty-six lines. There's a practical application: write a program to stuff a 42H there, and you'll get rid of the creep!

In the case of the display DCB, the current screen address of the cursor is stored (in reverse notation) in relative bytes three and four, and the cursor character is stored in byte

five.

Device Name

The final two bytes of each DCB contain a mnemonic for the device name: KI for keyboard (Keyboard Input), DO for the display (Display Output) and PR for the printer (PRint).

This concept is carried several steps further by LDOS, which allows for several DCBs beyond the standard three. In the case of the extra DCBs, the device can be named anything you want: CL for Comm Line, SP for Serial Printer or LP for Light Pencil. In operation, these DCBs can handle any device you assign to it — even fictitious or non-existent devices.

Filters, etc.

To be precise, the program in

Listing 1

00100 DRIVER LD A,C 00110 CP 30H ;get character into A register ;is it a zero?

CONVERT YOUR SERIAL PRINTER TO PARALLEL

The UPI serial printer interfaces allow an ASCII serial printer to be connected to the parallel printer port on TRS-80 Models I, II and III.

Software compatibility problems are totally eliminated because the TRS-80 "Thinks that a parallel printer has been attached. No machine language driver needs to be loaded into high memory. VISACALC, SCRIPSIT, BASIC, FORTRAN, etc. all work as if a parallel printer was in use.

The UPI interfaces are completely self contained and ready to use. A 34 conductor cable and connector plugs onto the parallel printer port of the Model I expansion interface or onto the parallel printer port on the back of Models II and III. A DB25 socket mates with the cable from your serial printer. The UPI interfaces convert the parallel output of the TRS-80 printer port into serial data in both the RS232-C and 20 MA. loop formats.

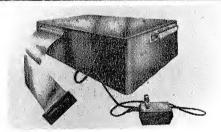


BINARY DEVICES

Formerly SPEEDWAY ELECTRONICS 11560 TIMBERLAKE LANE NOBLESVILLE, IN 46060 (317) 842-5020

TRS 80 is a trademark of Tandy

VISA MasterCard



Switch selectable options include:

- Linefeed after Carriage Return
- Handshake polarity (RS232-C)
- Nulls after Carriage Return
- 7 or 8 Data Bits per word
- 1 or 2 Stop Bits per word
- Parity or no parity
- ODD or EVEN parity

NEW VARIABLE BAUD RATE MODELS

Switch selectable from 110-9600 BAUD
UPI-3VB for models I or III \$149.95
UPI-2VB for model II \$149.95
UPI-3VB-6 for model I or III with 6 ft. cable
UPI-2VB-6 for model II with 6 ft. cable \$159.95

Shipping and handling on U.S. orders. \$4.00 90 day warranty on all interfaces, ten day return privilege.

28

Listing 1 should not be called a driver, but a *filter*: it's a subroutine which filters input to or from a device before the driver gets its hands on it. A routine which converts the "QWERTY" keyboard to "DVORAK" is a driver, while the code to add a LF to all CRs is a filter.

Using a filter, it is possible to assign special meanings to certain combinations of keys on the keyboard: that's how the JKL screen-print option was first instituted, and NEWDOS makes entry into MINI-DOS. It's not too difficult, for instance, to use the 4, 5 and 6 keys, when pressed simultaneously, to enter a subroutine which sends special codes to your printer (change type size, skip a line, start underlining, etc.) — just trap the keyboard driver, checking for a 70H in the A register.

One final idea: you could write a filter for the keyboard driver which would send all bytes to the printer first, then to the keyboard. Instant typewriter!

Listing	1	Continued
LISTINE		Continuea

00120	SPOT1	$_{ m JP}$	NZ,LPRDVR	; pass if not
00130	SPOT2	CALL	LPRDVR	print the zero
00140		LD	A,08H	;08H is a "backspace"
00150		LD	(37E8H), A	; and stuff it
00160		LD	A,2FH	;2FH is a "slash"
00170		LD	C,A	get it into the C register
00180	SPOT3	$_{ m JP}$	LPRDVR	; and go back to work.

Listing 2 - INIT to Driver

00190	INIT	LD	HL,(4026H)	get current LPRDVR
00200		LD	(SPOT1+1),HL	; and stuff that address
00210		LD	(SPOT2+1),HL	; into the 3 places we
00220		LD	(SPOT3+1),HL	; need it ourselves
00230		LD	HL,INIT-1	;point to end-of-code
00240		LD	DE,(4049H)	;point to top-of-memory
00250		LD	BC,INIT-DRIVER	;load up length of DRIVER
00260		LDDR		; and move the code
00270		LD	(4049H),DE	store new top-of-memory;
00280		INC	DE	;point to DRIVER
00290		LD	$(4026 \mathrm{H})$,DE	; and store that address
00300		JP	402DH	;all done.
00310		END	INIT 🖻	

INTERPRO CORPORATION

presents

KEY COMMANDER

by JAKE COMMANDER

For the TRS-80 Model I/III, 16-48K, Disk or Tape

Add more programming power to your keyboard than you've ever imagined. . .

- * SELF RELOCATING, SELF MODIFYING, and SELF PROTECTING to fit Model I, Model III, any memory size, cassette basic, or disk basic with any major DOS.
- * DRAW GRAPHIC PIC-TURES on the screen with single keystrokes, then save them in BASIC PRINT STATEMENT program lines.

or

* ASSIGN THE PICTURE TO A KEY so that, for example, (capital D) prints the picture of a dog!



- * ON SCREEN EDITING of ANY length lines. Merge or separate program lines. You can even EDIT LINE NUMBERS!
- * ASSIGN KEYS with any commands or graphics. Save your assignments to disk or tape. Unlimited assignments
- * USE IN DOS or while running other programs, to make them faster and easier to use.
- DEALERS INVITED -

order from:

INTERPRO CORP. • P.O. Box 4211 • 562 Corning Rd. • Manchester, N.H. 03108, U.S.A. • (603-669-0477)



DISK \$34.95

CASSETTE \$29.95



Pocket adventure

A real-time spoof

Pocket Computer

Robert D. Miller, Hopewell, VA

"You are in an empty room that will blow up in five minutes unless you can get out!! A window faces east. Open doors face west and north."

Sound familiar? If you've ever played one of the dozens of adventure games on a computer, large or small, then you know that these words announce the challenge of yet another adventure. What's so great about another adventure? Well, this one just happens to be written for the TRS-80 Pocket Computer (PC-1)! So now all of you Pocket Computer owners can get out and rub shoulders with the micro, mini and mainframe computer adventurers!

Actually, with the memory limitations of the PC-1, it is unlikely that a serious challenge for adventurers could be written. This program, which occupies every single byte of program memory, is actually a good natured tongue-in-cheek poke at the adventure programs written for larger computers. Although there is a surprise or two in store for the game player, the primary intent is just to have a little fun. With all due respect (and apologies, as necessary) to Crowther, Woods and Adams, whose ideas I have built upon, I present for your consideration and enjoyment a "Pocket Adventure!"

Key in the program exactly as listed. When you are through, press MEM to ensure that there are zero steps and zero memories remaining. Put the PC-1 in RUN mode and RUN the program. As is traditional with most adventure type programs, only limited instructions are provided. They are as follows:

- 1. Use only one word to describe the direction you wish to go.
- 2. You may use the whole word or just the first letter.
- 3. Quarter points of the compass (NE, NW, SE, SW) are ineffective.
 - 4. There is a solution.

The program is written in such a fashion that if you successfully complete the adventure or fail to escape the

room before time expires, you can restart the game by pressing ENTER.

This program utilizes some of the advanced features of the Pocket Computer. Line 10, for example, loads the program's "vocabulary" in variables A\$through L\$, yet these same values are accessed using a subscript technique in lines 80 and 90. As most PC-1 owners realize, two variable access techniques can be used interchangeably. In other words, A\$(1) refers to the same memory location as A\$, A\$(2) is B\$, A\$(3) is C\$, etc. In line 10, I chose to assign the values using A\$through L\$ because each assignment takes three less characters of program memory than if subscripts were used. Lines 80 and 90, on the other hand, use subscripts so that a loop procedure can access the vocabulary values.

Also in line 10, the variable N is used to store the number of "minutes" (chances) remaining. M\$ is used to store the letter "S," which is used to make the word "minute" plural in lines 60 and 600 when there is more than one minute remaining. As soon as the minutes (N) reduce to 1, the value of M\$ is made null (line 35).

Another advanced feature of the PC-1 is the ability to GOTO a line number contained in a variable. Lines 80 and 90 use this technique to send the program to a calculated location depending upon a proper match with an entry in the vocabulary list. Line 110 is used if the user enters a word that does not match any in the list.

Lines 200 through 710 contain the various routines used when there is a match between the user's response and an entry in the vocabulary list. All but one of the routines represent incorrect solutions and send the user back to line 30 for another try. The correct solution stops the program with the word "congratulations!!!!" Pressing ENTER at this point will restart the program.

Lines 900 and 910 are used when the "minutes" remaining reduce to zero (see line 30). The last thing displayed in this case are the words "the end." Again,

54 80-U.S. Journal

pressing ENTER at this point will restart the program. Line 950 is a subroutine called from two locations in the program (lines 450 and 900). Its function is to take a word and have it move across the display in a "Times

Square" fashion.

I realize that by entering a program of this type from a listing, one misses a lot of the impact they would normally have had from running the program without having seen it before. Even so, if you enter the program as written, without analyzing its content, I think you will find there are still a few surprises in store. Since the PC-1 is so portable, you can demonstrate the program to others quite easily and have fun observing their reactions. So, enter the program, enjoy it and remember that you've only got five minutes!

Program Listing for Pocket Adventure

10 :N=6:A\$="EAST":B\$="E":C\$="WEST":D\$=" W":E\$="NORTH":F\$="N":G\$="SOUTH":H\$="S"

2Ø :I\$="UP":J\$="U":K\$="DOWN":L\$="D":M\$=

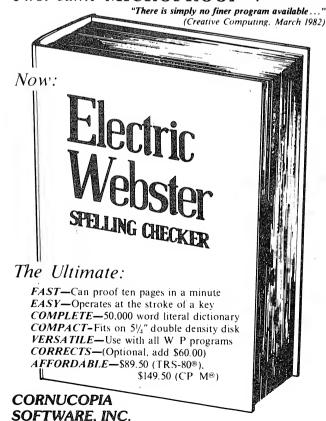
3Ø :N=N-1:IFN=ØTHEN9ØØ

35 :IFN=1LET M\$=""

40 :IF N<5PAUSE "TRY AGAIN!!"

5Ø :PAUSE"YOU ARE IN AN EMPTY ROOM":PAU

First came MICROPROOF™:



30

Contact your local dealer, or order direct - (415) 524-8098

1625 Beverly Place Berkeley, CÁ 94707

QUALITY INNOVATION SUPPOR SOFTWARE IDNEER 746 NORTH WEST 55TH. AVE. #204 LAUDERHILL, FLORIDA 33313 PHONE 1-(305)-739-2071

SCRIPSIT A COMPLETE

BUY BOTH (SCRIPTR + CRAYON) THIS MONIH + GET \$10 OFF

GRAPHIRAX' ITALICS UNDERLINE-DOUBLE EMP+JUSTIFY TEXT DIAL -A-PRINI - GET LETTER QUALITY BY REPRINTING LINES ENTER/EXIT SCRIPSIT AT WILL WITHOUT LOSING TEXT BUE. OUTPUT ANY CODE (S) (#-255), DIRECT FROM THE TEXT. SIMPLE LETTER COMMANDS CONTROL EVERY MX-B# + 1##

OUTPUT ANY CODE (S) (#-255), DIRECT FROM THE TEXT. SIMPLE LETIER COMMANDS CONTROL EVERY MX-8# + 100 PROGRAMMABLE FEATURE INCL. VAR LINESPACING AND FORMS. WRITE FORM LETIERS AND INPUT DATA INTO REPORT FORMS. DISPLAY ONLY MODE HELPS SHOW WHERE PAGES START/END. EDIT MODE FOR FRORS, CHANGES, GRAPHICS OR PAUSING.

EDIT MODE FOR FRRORS, CHANGES, GRAPHITS OR PAUSING.
SELECTED PAGES PRINTED DIRECT/CURRECT HEADERS, PAGEN'S
PRINT OUT FULL SCREEN PICTURE FILES MADE BY CRAYON'
7 SAMPLE TEACHING PROGRAMS TAFE YOU STEP BY STEP.
66 PAGE MANUAL, BOUND, INDEXED, COMPLETELY REVISED,
CUSTUM VERSIUNS AVAILABLE FOR THE FOLLOWING PRINTERS;
MICROLINE-BD + 82A, PROWRITER + LP IV. + VIII + F-10
DAISY WHEEL 2 VER, ALLOWS SUB/SUPER SCRIPTING 10*, 12*
+ PROPORTIONAL -UNDERLINING-1+1/2 LEGAL LINE SPACING

EMPHASIZED, DIAL-A-PRINT, PROGRAMMABLE OVERSTRIKE MODE.

MX 80/100 VER. WORKS WITH/WITHOUT GRAPHIRAX 80 OR PLUS DISK SCRIPTR MOD 1/3 = \$40.00 MOD 1+111. VERSIONS BOTH WORK WITH MODEL I. SCRIPSIT/LC NO PATCHING REQUIRED. CASSETTE SCRIPTR MOD 1/3 = \$40.00 WORKS WITH REG.SCRIPS 1.0 FOR MOD 1/3 REO.32k.+ LC/MOD SCRIPTR IS A 5.5k PROC

WORKS WITH REG.SCRIPS. SCRIPTR IS A 5.5% PROG. CHARGETTE SERTETH MUD 173 = \$40.00 WURES WITH REG.SCRIPS. 1.0 FOR MOD 173 REO.32F.+ LC/MOD SCRIPTR IS A 5.5 PROG. SEND FOR OUR FREE BROCHURE THAT DEMONSTRATES ALL FEATURES SCRIPTR IS WELL DOCUMENTED AND BUG FREE! CUSTOMER SUPPORT SATURDAYS + EVENINGS FOR YOUR CONVENIENCE, FREE BROCHURE!

FLEASE INCLUDE THIS INFORMATION WHEN ORDERING NAME TYPE FRINTER ADDRESS COD'S ACCEPTED CHECKS - MONEY ORDERS COD'S ACCEPTED CASSETTE/DISK SCRIESIT VER #

IS A GRAPHICS DESIGN UTILITY CRAYON DOES IT ALL!! OWNER SHOULD BE WITHOUT.

YOU'VE SEEN THE ADS FOR OTHER DRAWING PROGRAMS. SOME CHARGE AS MUCH AS \$150.00 FOR THE ABILITY TO ADD GRAPHICS TO YOUR PRINTOUTS. CRAYON ISN'T A CONVERTED TEXT PROCESSOR CRAYON WAS DESIGNED FROM THE GROUND UP TO GIVE YOU THE VERY FINEST GRAPHIC'S EDITOR POSSIBLE. COMPLEX GRAPHICS VERY FINEST GRAPHIC'S EDITOR PUSSIBLE. COMPLEX GRAPHICS REQUIRE ROUTINES TO MOVE AND MANIPULATE GRAPHICS THAT NO TEXT PROCESSOR CONTAINS. ALSO CRAYON PRODUCES SUPER HIGH SPEED GRAPHICS THAT YOU CAN ACCESS FROM YOUR ASSEMBLY AND BASIC PROGRAMS. ALSO WITH A BLOCK GRAPHICS PRINTER AND SCRIPTR YOU CAN PRINT OUT YOUR CRAYON FILES FROM SCRIPSIT.

IL PRUGHAMS. ALSU WITH A BLUCK GRAPHICS PRINTER AND IPTR YOU CAN PRINT OUT YOUR CRAYON FILES FROM SCRIPSIT. EFORE YOU WASTE YOUR MONEY ON HALF A PROGRAM CHECK OUT CRAYON'S MANY FEATURES. CRAYON DOES IT ALL!!!

TYPESET LOGG'S - LETTERHEADS - ENVELOPES - BUSINESS CARDS AND OTHER OFFICE FORMS. THIS AD WAS TYPESET FROM AN MX-80 PRINTOUT THEN SHRUNK. COST = \$4.50 IF AD WAS TYPESET AT A PRINTSHOP THE COST = \$2.00 + CREATE AND RUN REAL CARTOONS WITH CRAYON AND THEN RUN YOUR CARTOONS FROM BASIC AT ASSEMBLY LANGUAGE SPEEDS. SPEEDS OF 35 FRAMES/SECOND POSSIBLE. USE IT TO DESIGN DISPLAYS FOR USE IN BASIC & ASSEMBLY PROG'S MANAGE DISPLAYS FOR USE IN BASIC & ASSEMBLY PROG'S MANAGE DISPLAYS FOR USE IN BASIC & ASSEMBLY PROG'S COMMENT THEM. MOD 3 DIR. WORKS ON A TRSDOS SYS. ONLY. DRAW ANYTHING YOU DESIRE ONTO THE SCREEN AND PRINT IT OUT OR SAVE IT TO DISPLAYBE ONTO THE SCREEN AND PRINT IT OUT OR SAVE IT TO DISPLAYBE ONTO THE SCREEN AND PRINT IT OUT OR SAVE IT TO DISPLAYBE ONTO THE SCREEN AND PRINT IT OUT OR SAVE IT TO DISPLAYBE ONTO THE SCREEN AND PRINT IT OUT OR SAVE IT TO DISPLAYBE ONTO THE SCREEN AND PRINT IT OUT OR SAVE IT TO DISPLAYBE ONTO THE SCREEN AND PRINT IT OUT OR SAVE IT TO DISPLAYBE ONTO THE SCREEN FILE. SCREEN FILES MAKE CRAYON A FAST EASY WAY TO KEEP AN ELECTRONIC NOTEBOOK. FAST EASY WAY TO KEEP AN ELECTRONIC NOTEBOOK.

PREFORM ALL VIDEO WORKSHEET FUNCTIONS RIGHT ON SCREEN

USER ERIENDLY / 42 PAGE DOC'S.OFFSET PRINTED.INDEXED

1). USER FRIENDLY / 42 PAGE DUC 5,0F5EI P 2). NINE CHARACTER USER DEFINED CURSOR. --3). 16 LETTER COMMANDS FOR GRAPHICS ENTRY. 4). COPY CHARACTERS IN ANY DIRECTION FAST.

4). COPY CHARACTERS IN ANY DIRECTION FAST.
5). UPPER/LOWER CASE SUPPORT WITHOUT DRIVERS.
6). DO ALL OF THE FOLLOWING ON VARIABLE LENGTH LINES->
COPY-FILL-DELETE-EXCHANGE-MOVE-PULL-UC/LC-INVERT
GRAPHICS-PRINT-JUSTIFY TEXT-BUFFER/RESTORE TO SCREEN.
7). UTILITIES INCLUDE--> MASK - AUTOMATIC PRINT## NUMBERS
CURSOR LOCATION AND VALUE-3 SELECTIVE CLS'S-PATTERNEXTRA BUFFERS-COMBINE SCREENS -HEXDUMP-SEARCHES. MORE
8). FULL DISK / CASS I/O DIR-WRITE-LOAD-APPEND-COPY-KILL
SCREENPRINT- OUTPUTS CODES TO DRIVE ANY PARALLEL PRINTER
PROFESSIONALLY WRITTEN & SUPPORTED-NO PROGRAMMING REQUIRED
OVER 90 COMMANDS -> FAST / EASY / FUN <- ALL MACHINE LANG.
CASS MOD I+3=435.00 / DISK MOD I OR 3=454.00 I MK PROGRAM
WORKS IN 16k. OR MORE AND ADJUSTS TO MEMORY SIZE CHANGES.
ESPECIALLY FOR MX-80, MICROLINE® AND OTHER BLOCK GRAPHIC
PRINTERS. PRINTER NOT REQ. FOR FILE HANDLING + CARTOONS.
LIBERAL DEALER TERMS AVAILABLE - INQUIRIES INVITED

SE"THAT WILL BLOW UP IN"

60 :USING "##":PAUSE N;" MINUTE"; M\$;"!! ":PAUSE"UNLESS YOU CAN GET OUT!!"

70 :PAUSE "A WINDOW FACES EAST.":PAUSE" OPEN DOORS FACE": PAUSE"WEST AND NORTH."

75 :U=1:INPUT"DIRECTION? ";Y\$

80 :Q=U*50+150:IF Y\$=A\$(U)GOTO Q

90 :P=U+1:IF Y\$=A\$(P)GOTO Q

100 :U=U+2:IF U<12GOTO 80

110 :PAUSE YS:" IS NOT":PAUSE "IN MY VO CABULARY.":GOTO 30

200 : PAUSE "YOU HAVE LEFT THE": PAUSE"WI NDOW FROM AN ALTITUDE"

210 :PAUSE "OF 1,110 FEET!!":PAUSE "(YO U WERE IN THE": PAUSE"WORLD TRADE CENTER 1)"

220 : PAUSE "YOU HAVE BROKEN EVERY": PAUS E "BONE IN YOUR BODY!!": PAUSE" (WHAT A M ESS!!..YECCHH!)"

23Ø :GOTO 3Ø

300 :PAUSE"YOU ARE IN THE BATHROOM.":PA USE"YOUR LEFT FOOT IS":PAUSE "RESTING I N A LARGE"

310 :PAUSE "WELL-ROUNDED":PAUSE"PERFECT LY PROPORTIONED": PAUSE" ICE COLD": PAUSE"

TOILET BOWL!!": GOTO30

400 :PAUSE"YOU HAVE STEPPED INTO":PAUSE "AN ELEVATOR SHAFT!!"

410 :PAUSE"THERE IS NO ELEVATOR!!":PAUS E"YOU ARE GOING":T=0:R\$=".....":S\$="DO WN!":GOSUB 95Ø

420 : PAUSE" SPLAAAAAAAATTTTTTT !!":GOT O 3Ø

500 :PAUSE "YOU HAVE RUN INTO A WALL":P AUSE"AND BROKEN YOUR NOSE.":PAUSE" \$! (OUCH!!)":GOTO 3Ø

600 :PAUSE "YOU HAVE ESCAPED":PAUSE"WIT H";N;" MINUTE";M\$:PAUSE"TO SPARE!!"

610 :PRINT" CONGRATULATIONS!!!!":GOTO 1Ø

700 : PAUSE "WITH A PITCHFORK": PAUSE" AND HORNS AND...":PAUSE"...OH, WELL!!!":GO TO 30

900 :T=1:R\$=" ":S\$="TICK!":GOSUB 9 50:BEEP 5:PAUSE R\$;" KA-BOOOOM!!!!"

910 :PAUSE"YOU ARE DEAD!!!!":PRINT RS:" THE END":GOTO 10

950 :PAUSE S\$:BEEP T:PAUSE R\$;S\$:BEEP T :PAUSE R\$;R\$;S\$:BEEP T:PAUSE R\$;R\$;R \$:RETURN

MISOSYS MISOSY M SOS MISOSYS

Compiler

The "LC" Compiler provides a substantial subset of the C programming language with:

o Integer subset of C; has access to floating point ROM routines via functions

o All statements supported except: SWITCH-CASE, GOTO, TYPEDEF, STRUCT, UNION.

o All operators except "->",
".", SIZEOF, (TYPENAME).
o Standard I/O redirection

with device independence. o Input using FGETS or GETS

functions support JCL. o Dynamic memory management. o Sequential files open for:

READ, WRITE, and APPEND. o LC Generates Z-80 EDAS-IV source code as output.

o Z-80 "source" libraries in ISAM-accessed PDS files. o Compact, one-line compiler invocation for easy use.

o Compiled programs run on both Model I and Model III

o IN/LIB accesses gra and LDOS entry points graphics

o LC/LIB includes: FPRINTF, PRINTF, ALLOC, FREE, SBRK, and String functions.

o LC: The Mod I/III version includes: LC/CMD, LC/LIB, FP/LIB, IN/LIB, EDAS-IV, XREF, and more than 200 pages of documentation. Requires 2-drive 48K LDOS Mod 1&3 for LDOS: \$15Ø+\$4S&H



MISOSYS MISOSYS MISOSYS MISOSYS

LDOS, Version 5.1 is the Ultimate in Operating Systems for the TRS-80 Models I and III. MISOSYS is your East Coast Headquarters for LDOS, the documented system! Version 5.1 is priced at \$129.00 + \$5.00 S&H per system. Deduct \$35 if ordering both.

ર્જ SASOSIW SASOSIW SASOSIW SASOSIW

CER ASP

Finally, user customized character sets for your MX-8Ø Graftrax and MX-1ØØ printers. With GRAphic Support Package you create character sets usable from any and all applications. Create character sets of single-width, double-width, & 12-pitch, using the GRASP character editor, ALTCHAR GRASP comes complied with 7 character sets. comes supplied with 7 character sets. Print Mod3 special characters on your Epson! Set MX options from your keyboard. Invoke underlining! Written by K.A.Hessinger & S.A.Loomer. GRASP: \$50+\$25&H



SOSYS MISOSYS

32

MISOSYS - Dept. P.O. Box 4848 Alexandria, VA 223Ø3-Ø848 7Ø3-96Ø-2998 Dealer's Inquiry Invited



SYSOSI

S

ISOS

EDAS, Version IV is the most fantastic absolute address assembler, bar none! It has: o Assemble to disk or memory š

MISOSYS

3

SOSYS

3

SOS

₹YS ;

SYSOSIM

₹

SOSYS

3

SOSI

from multiple source files nestable to FIVE levels. o Assemble conditional code

with IF, IFLT, IFEQ, IFGT, IFDEF, IFNDEF, IFREF to 16 levels with IF-ELSE-ENDIF. o Automatic search of SOURCE

subroutine libraries saved in ISAM-accessed structure to resolve references left undefined (requires PDS).

o One-level MACROs support parameter substitution by position and by keyword. o Local labels in both MACRO

expansions & PDS searches.
o Supports +, -, *, /, MOD.
.AND., .OR., .NOT., .XOR.
o Constants can be declared as base 2, 8, 10, & 16 or string, with more than one

value on a single line. o 15-char labels including special chars: 0, ?, \$,_

o Extensive cross-reference utility & EQU generation. o Enter source in upper case

or lower case. Line editor has COPY, CHANGE, and MOVE o Pseudo-OP's LORG, COM, PAGE TITLE, SUBTTL, SPACE. Model I/III for LDOS: \$100

Model II for TRSDOS: \$200 Add \$4 S&H + 4% VA tax.

∑SASOSIW SASOSIW SASOSIW

Ξ

ISOSYS

DOSPLUS 3.4 and 3.4D

An operating system that makes compatibility easy

Model I/III

Captain Paul M. Hine, San Diego, CA

The TRS-80 Model I owner can easily lay claim to a wider choice of operating systems and hardware configurations than for any computer system since the IBM System 360. The choices vary from the simple (TRSDOS 2.3 and OS-80) to the very complete (NEWDOS/80 version 2.0 from the folks at Apparat). In between have been the excellent products from LOBO and Microsystems Software, as well as NEWDOS-PLUS.

In their current offering, Microsystems Software has made worthwhile revisions to DOSPLUS 3.3, with enhancements to both the DOS and BASIC language portions of the package. The most marked change has been in documentation. which is now competitive with that offered by the finest software houses in the microcomputer support business. The least apparent change is one of adaptability to other systems designed to support hard disk systems on the TRS-80. Compatibility to eight inch floppy drives is also included if the system is configured with an appropriate drive controller.

I reviewed this new operating system using a Model I TRS-80 with an LNW expansion board, LNDOUBLER (to attain double density operation), and three disk drives. Drive zero was a 40-track (MPI B51), and both of the other drives were 80-track units (also MPI). Although DOSPLUS supports lower case modifications and automatically senses this installation, I didn't have one installed. A speedup installation can also be installed and the DOS will manage it to avoid I/O incompatibility.

All three drives were operated at six millisecond track stepping, and the 80-track drives were operated both as 80-track units and, with novel "track skipping", as 40-track drives.

Three distinct grades of floppys were used and the results were locked out during formatting. On premium floppys, no granule lockouts occurred, proving that for 80-track, double density operation, you get pretty much what you pay for. During 75 hours of operation, three CRC errors happened, and all of these were on the economy floppys. This was cured by using the verify mode of DOSPLUS, which fought through the lower grade floppys without further lost data.

Earlier versions of DOSPLUS gained a reputation for reliability, ease of use and poor documentation. The whole documentation issue can be put to bed right away. The user's manual provided with DOSPLUS 3.4/4.0 is handsome, well written. well organized and readable! Some reference to Radio Shack's TRSDOS manual may be advisable, so don't throw that away if you purchase DOSPLUS. The assembly language buffs will be delighted with documentation for many calls to DOSPLUS routines. Some of these are understandable and handy for us BASIC language types to modify our little machine language modules and monitors. The printer driver is flexible enough to handle just about any ASCII serial or parallel printer. and even does the graphics conversions for EPSON owners. This DOS can do nearly anything the others can, including:

1) Formatting from 20 to 96 cylinders (new word for track) on any drive in either single or double density.

2) Double stepping an 80-track drive to produce or read a 35- or 40-track floppy (you can change it back and forth by command from a BASIC program if you need to change disks).

3) Using any drive as either a double density or single density drive without making any changes in "system" or configuration files. Just put the disk in the drive and DOSPLUS selects the appropriate controller chip to run the show. Files from single density TRSDOS formatted disks can be "copied" directly to double density disks and vice versa!

Format is one of the long suits offered by DOSPLUS. During the format of cylinders (called that for compatibility of terminology with the dual-headed and hard disk crowd), the head is stepped toward the center as in TRSDOS and NEWDOS/80. When the innermost track is reached, the verification is done from inside-out. Aside from being quicker than TRSDOS or NEWDOS, this technique looks for excessive radial error due to hystersis in the drive's stepper. (Hystersis is the slop in a leadscrew or band positioner. That is bad news, particularly on 80-track drives.)

If the format operation verifies, and the system is operated in the Verify mode (read and verify after each write), you can be assured of good data reliability. Where

December, 1982 57

DOSPLUS 3.3 displays the sector being verified, 3.4 displays the process by cylinder and granule. This formatter is improved over 3.3, as it locks out individual granules with flaws instead of locking out a whole track. This can save some previously wasted space on floppys which have several bad spots and multiple track lockouts.

The Format utility (as well as Backup, Copy and Diskzap) is menu driven and straightforward in operation. For the students of Mr. H. C. Pennington, there are two (count 'em—two) ZAP-type utilities. Both are written in machine language and are fast. One, Diskzap, is a very complete track- and sector-oriented display/modify utility, which also includes formatting, copy, verify and print functions (it looks as if it were designed with Harv's book open to a "how to" page).

The other zapper is called Diskdump. While being track and sector oriented, it is entered by using the file specification. This initial time (and patience) saver is only a small taste of what is to follow, because changes can be entered in either Hex or ASCII. (It is a quick and painless way to change a couple of bytes in any file or machine language utility without writing a program, or doing a reassembly and dump, to complete the job).

As in DOSPLUS 3.3, the DIR command provides a complete directory sector breakdown including all file attributes. The MAP command is unchanged, still showing the track and sector assignments for each file (the sharpeyed will note sufficient leading zeroes on track and sector attributes to accommodate the larger hard disks). The FREE command still provides a graphic display of all tracks and granules on the disk. DOSPLUS 3.4 adds a new command—"CAT" (or catalog). This provides a display like DIR in TRSDOS or NEWDOS.

The Model I display cursor is a square block, similar to that used on the Model III. A boot option permits accessing the Level II I/O drivers and the conventional cursor is displayed to remind you that these are in use. The keyboard is

debounced when the block cursor is displayed and the repeating key is featured on the entire keyboard.

The FORCE command from 3.3 is continued so that I/O can be redirected. Version 3.4 also features a new command-JOIN, so that output can be paralleled to two devices simultaneously (display and printer, and in Model III, display and RS-232). The previously supported AUTO, DO and BUILD commands are continued to provide for automatic execution of commands or programs at boot-up time. The only missing command is CLEARFILE, which used to erase file data while leaving the directory entry intact.

All practical commands and utilities are available from BASIC. Rather than having a reduced set of DOS commands during BASIC operation, Microsystems chose to load a larger BASIC for program development and then use most of the DOS for support. Programs can be called for execution under a smaller BASIC called TBASIC. This language module supports all of the microsystems extensions to BASIC. but has no access to the DOS commands (except for those which are supported by BASIC reserved words—TIME\$, etc.). The extensions to BASIC include a single step trace. global editing of text files (SR command), and a memory dump of variables (M command), which, if used with an ONERROR statement, can parallel the finest mainframe debugging systems.

Two extensions which are new to 3.4 include a sort utility for BASIC arrays (O command) and a new reserved word—INPUT@, which eases screen formatting during data entry routines. INPUT@ sets, and clearly indicates, input field length. Interestingly, it can provide elementary input editing to restrict alphabetic characters from numeric fields! Unfortunately, the "O" command, as well as "M" and "SR", aren't available from TBASIC.

The only mild irritation, to date, is the requirement to enter BASIC and execute a CMD"T" to disable interrupts. While the need is seldom, I've added two commands (EI/CMD and DI/CMD) to avoid the problem.

In all other respects, I found DOSPLUS 3.4D to be smooth, fast, powerful, and operator-oriented. Nothing showed up to cast a shadow on the DOSPLUS reputation for rock steady reliability. All of the NEWDOS/80 options aren't included, but the automated features of this DOS do away with the need for many of the NEWDOS switches and SYSGEN-type options. Microsystems does not include an Editor/Assembler or Disassembler with this package. Instead, a separate machine language support package is offered as a distinct product.

DOSPLUS showed strong upward compatibility with all forms of programs and data from TRSDOS 2.3. It operated satisfactorily on single density files and programs from NEWDOS/80 version 2.0 with the exception of marked-item formats. Both NEWDOS/80 and TRSDOS 2.3 had trouble reading DOSPLUS disks, due, most probably, to the extended protocols in granule allocation table codes.

Microsystems Software is offering a newsletter to users and promises both zaps and updates at reasonable prices. Patches are reportedly available for a wide variety of programs including the Microsoft BASIC Compiler. SCRIPSIT patches are available, along with patches to some other commercially available patches for special printer support. The availability of these patches makes DOSPLUS a very attractive upgrade for the established TRSDOS or OS-80 user. For the TRS-80 user upgrading to double density, or one who finds that he or she has a mixed bag of disk drives, DOSPLUS 3.4D is the easy answer. For the user with both Model I and Model III machines, the DOSPLUS system offers a high degree of compatibility.

DOSPLUS 3.4 or 3.4D are available from Microsystems Software, Inc., 4301-18 Oak Circle, Boca Raton, FL 33431, (305) 983-3390. The operating system is also available for Model I or PMC in single density, as well as for the Model III. All versions are the same price, \$149.95.



33

Bounceoids copyright 1982 by the Cornsoft Group

TRS 80® is a registered trade mark of the Tandy Corporation

All TRS-80[®] Color Take Your Pick



A Smart Investment

Each of Radio Shack's popular TRS-80 Color Computer models is now on sale. You can get a complete, versatile system for as low as \$299.95. It's the affordable way for the entire family to start computing! Or if you require a system for advanced applications—like high-resolution color graphics—choose one of our "professional" models for as low as \$399.95.

Easy to Use

Plug in an instant-loading Program Pak™ cartridge and you can play exciting games, keep a personal budget, solve problems, analyze investments, write letters and themes, set up a household inventory, and much more. A TRS-80 Color Computer is educational, too. The kids can learn to type, sharpen math skills, become an artist, compose music, even improve reading.

Write Your Own Programs

Our easy-to-use Color BASIC is ideal for home or school applications. You can create graphics with up to eight colors, and incorporate music and sound effects into your programs, too. Our entertaining tutorial manual shows you how! You get a 32 × 16 screen format, data and string handling, dimensioned arrays, math functions, 9-digit numeric accuracy and more. Save your work with an optional cassette recorder,



More Versatility

Add a pair of joysticks (26-3008, \$24.95) and get faster, more realistic game action! Use joystick instructions in your own programs, too.

Computers Cut \$100 and Save Big!



A Programmer's Dream

If you want to create high-resolution color graphics, then select a sale-priced TRS-80 Color Computer with Extended BASIC. Using one-line commands, you can easily produce incredible drawings, charts, even animation. Get 16K memory for \$399.95 (26-3002, reg. \$499.95) or 32K memory for \$549.95 (26-3003, reg. \$649.95). We even include two tutorial manuals.



Amazing Printouts

Add our new CGP-115 Color Graphics Printer (26-1192, \$249.95) for beautiful diagrams and upper and lower case text in four colors!

Sophisticated

Extended BASIC offers the programmer a 256 × 192 screen resolution, editing, tracing, error messages, user-definable keys, PEEK, POKE and more.

Expandable

Add disk drives, a printer, graphics tablet, digitizer, modem and other peripherals to meet future needs.

The Perfect Gift to Give . . . or Get!

Get your TRS-80 Color Computer at a Radio Shack Computer Center, store or participating dealer today.

Radio Shaek

The biggest name in little computers™

A DIVISION OF TANDY CORPORATION

Retail prices may vary at individual stores and dealers.

DON'T GET LOSKED IN

Pascal Basic Cobol Forth Pilot Fortran

Data Base Management
Word Processor
Communication Utility
Accounts Receivable
Accounts Payable
Engineering Utility

Spread Sheet Inventory

Logo "C" Gen Mail Mac

General Ledger
Mailing List
Macro Assembler
Education

TRSDOS*

CP/M**

Open your doors to a world of SOFTWARE with LNW computers. You'll get **MORE PERFORMANCE**¹ than with the IBM PC² the Apple II³ TRS80 MODEL II or TRS80 MODEL III⁴ along with software support of TRSDOS or CP/M, the TWO MOST WIDELY USED OPERATING SYSTEMS. This means you, the user, can select from the largest base of business or personal software.

Standard Features: A serial RS232 communication port, parallel printer port, Hi-Resolution (480x192) B/W and COLOR graphics, an 80 character-perline screen display along with Quad-density interface for 5" or 8" floppy disk storage offering immediate access to 3.5 million characters, or optional Hard disk

interface to 5 or 10 million characters.

Standard Software: LNWBASIC and DOS PLUS operating system packages, commanding all the above features, are included.

The LNW computer will be the key to your success with the starting price at \$1695.00, along with a full 6 month warranty.

Dealers: You too can open the door to a successful product. Call for our special dealer programs: . (714) 544-5745.



LNW Computers

2620 Walnut Avenue Tustin, California 92680 (714) 544-5744

*TRSDOS is a trademark of Tandy Corp.

**CP/M is a trademark of Digital Research Corp.

1. Performance is based on bench mark test in the JAN 1982 issue of BYTE magazine, pg. 54, with LNW80 II as the comparison.

2. IBM PC is a trademark of IBM CORP.

3. APPLE II is a trademark of APPLE COMPUTERS

TRS80 is a trademark of Tandy Corp.

35

International orders please inquire for pricing/shipping cost.

Color Computer sorting

A routine for quick results

Color Computer

Mark D. Goodwin, Orland, ME

Sooner or later you'll probably write a program which requires sorted data. Sorting the elements of an array can be very time consuming, if the sort is done by a BASIC subroutine. A BASIC sort is adequate, when the array is small. But if you should have to sort a large array, say 1000 elements, you could be twiddling your thumbs for quite some time.

Enter machine language. A machine language sort can sort an array in a fraction of the time a BASIC sort routine requires. Listing 1 contains a general purpose sort routine. It can sort both string and numeric data. The size of the array is limited only by the memory size of your computer. A partial sort can also be accomplished.

In order to understand the sort routine, you must first know its requirements. The routine requires a string array, which will be sorted, and a numeric array, which is used for an index. On entry to the routine you must POKE the following values into memory: 3FF1 — VARPTR of the 1st element in the strong array. 3FF3 — VARPTR of the 1st element in the numeric array. 3FEF — number of elements to be sorted, minus one.

With the above information, let's tackle the program. In order to speed up program execution, I chose to utilize the 6809's direct page-addressing mode. This of course rules out relocatability, but this isn't a very serious limitation. The program is written for a 16K machine, but can be used on a 32K machine with the following changes:

0002 ORG \$7FFF-\$9C

0003 SETDP \$7F

0004 START LDA #\$7F

The program should contain sufficient comments to understand how it works. The program can be assembled easily with an editor assembler. First enter the program line by line. Be sure to make the appropriate changes if you want to utilize the full memory of a 32K computer. Once the program has been entered, double check the program for errors. Now save a few

copies of the object code on cassette. Follow this by saving a few copies of the source code in case any typos were missed. Remember, an ounce of prevention if worth a pound of cure.

If you don't have an editor assembler, enter the program in Listing 2. This is a BASIC version, which POKEs the sort routine into memory. To use the program with a 32K machine, change line 90 to:

90 DATA 134, 127, 30, 139, 151, 255, 15, 252

For a 32K computer the memory addresses in Listing 2 will have to be changed. Simply change the 3Fs to

Listing 1

0001	0600			NAM	SORT	
0002	0600			ORG	\$3FFF-\$9C	
2000	3F63			SETI)P \$3F	
0004	3F63	863F	START	LDA	#\$3F	NEW DP VALUE
0005	3F65	1E3B		EXG	A, DP	A = OLD DP = NEW
9000	3F67	97FF		STA	<old< td=""><td>SAVE OLD DP</td></old<>	SAVE OLD DP
0007	3F69	OFFC	ST1	CLR	< NUM	CLEAR SORT FLAG
0008	3F6B	DCEF		LDD	<v1< td=""><td>D=#ELEMENTS-1</td></v1<>	D=#ELEMENTS-1
0009	3F6D	DDF5		STD	<len .<="" td=""><td>LOAD VARIABLE</td></len>	LOAD VARIABLE
0010	3F6F	DCF1		LDD	<v2< td=""><td>D=VARPTR(A\$(1))</td></v2<>	D=VARPTR(A\$(1))
0011	3F71	DDF7		STD	<stp _<="" td=""><td>LOAD VARIABLE</td></stp>	LOAD VARIABLE
0012	3F73	DCF3	*	LDD	<v3< td=""><td>D=VARPTR(A(1))</td></v3<>	D=VARPTR(A(1))
0013	3F75	DDF9		STD	<int< td=""><td>LOAD VÄRIABLE</td></int<>	LOAD VÄRIABLE
0014	3F77	9EF7	ST2	LDX	<stp< td=""><td>X=STRING POINTER</td></stp<>	X=STRING POINTER
0015	3F79	A684		LDA	, X	A=LEN(STRING1)
0016	3F7B	97FD		STA	<len1< td=""><td>SAVE IT</td></len1<>	SAVE IT
0017	3F7D	EC02		LDD	2,X	D=STRING1 POS
0018	3F7F	1F02		TFR	D,Y	PUT IT IN Y
0019	3F81	A605		LDA	5, X	A=LEN(STRING2)
0020	3F83	97FE		STA	<len2< td=""><td>SAVE IT</td></len2<>	SAVE IT
0021	3F85	EC07		ממגו	7,X	D=STRING2 POS
0022	3F87	1F01		TFR	D, X	PUT IT X
0023	3F89	1E12			X, Y	EXCHANGE X AND Y
0024	3F8B	96FE		LDA	<len2< td=""><td>A=LEN(STRING2)</td></len2<>	A=LEN(STRING2)
0025	3F8D	2706		BEQ	ST5	IF A=O JUMP
0026	3F8F	96FD		LDA	<len1< td=""><td>A=LEN(STRING1)</td></len1<>	A=LEN(STRING1)
0027	3F91	271C		BEQ	NOSWAP	IF A=O JUMP
0028	3F93	2006		BRA	ST3	JUMP
0029	3F95	96FD	ST5	LDA	<len1< td=""><td>A=LEN(STRING1)</td></len1<>	A=LEN(STRING1)
0030	3F97	2716		BEQ	NOSWAP	IFA=O JUMP
						December 1992 63

December, 1982 **63**

7Fs. For example:

30 CLEAR200,&H7F62

Before loading the machine language version, enter CLEAR200, &H3F62 or CLEAR200,&H7F62; depending on the memory size of your computer. This is necessary to reserve the memory for the sort program. In line 30 the BASIC version reserves memory for you.

Listing 3 demonstrates the use of the sort routine. It only sorts an array of ten elements, but should help in understanding how the routine is used. The program uses the TIMER function to time the sort. I won't tell how long the sort takes because I prefer to surprise you.

You may have wondered why the sort routine uses a numeric array at all. This array can be quite useful as an index. If you want to sort a disk mail list file by zip codes; simply set the string array to the zip codes, sort the data and save the index on the disk. Now the mail list can be accessed by using the index. This eliminates the need of rewriting the entire mail list file after the sort. If an index isn't needed, use a dummy numeric array for the sort routine. A numeric array can be sorted by loading its values into a string array with the STR\$ command. Then sort the string array and transfer the data back with the VAL command.

I hope you find this sort routine useful. There are many uses for sorted data and having the ability to sort data quickly can greatly enhance any program.

Ed. note: The author is making these programs available on cassette (\$9.95) or disk (\$11.95) plus \$2 shipping and handling. Contact: Mr. Goodwin at Star Route 790, Box 103, Orland, ME 04472.

0031 3F99 2008	ST3	BRA SWAP	JUMP
0032 3F9B A6B0		LDA ,X+	PUT CHAR IN A
0033 3F9D A1A0		CMPA ,Y+	COMPARE STRINGS
0034 3F9F 272D		BEQ ST4	IF = JUMP
0035 3FA1 250C 0036 3FA3 9EF7 0037 3FA5 8D37 0038 3FA7 9EF9 0039 3FA9 8D33	SWAP	BCS NOSWAP LDX <stp <int="" bsr="" ldx="" move="" move<="" td=""><td>IF > JUMP X=STRING POINTER SWITCH STRINGS X=INDEX POINTER SWITCH INDEX</td></stp>	IF > JUMP X=STRING POINTER SWITCH STRINGS X=INDEX POINTER SWITCH INDEX
0040 3FAB 8601		LDA #1	A=1
0041 3FAD 97FC		STA <num< td=""><td>SET SORT FLAG</td></num<>	SET SORT FLAG
0042 3FAF CC0005	NOSWAP	LDD #5	D=5
0043 3FB2 D3F7		ADDD <stp< td=""><td>+ STRING POINT</td></stp<>	+ STRING POINT
0044 3FB4 DDF7		STD <stp< td=""><td>SAVE IT</td></stp<>	SAVE IT
0044 3FB4 DDF7 0045 3FB6 CC0005 0046 3FB9 D3F9 0047 3FBB DDF9			D=5 + INDEX POINT
0048 3FBD 9EF5 0049 3FBF 301F		STD <int LDX <len LEAX -1,X</len </int 	SAVE IT X=#ELEMENTS DECREMENT IT
0050 3FC1 9FF5		STX <len< td=""><td>SAVE IT</td></len<>	SAVE IT
0051 3FC3 26B2		BNE ST2	IF X<>O JUMP
0052 3FC5 96FC		LDA <num< td=""><td>A=SORT FLAG</td></num<>	A=SORT FLAG
0053 3FC7 26A0		BNE ST1	IF A<>O JUMP
0054 3FC9 96FF		LDA <old< td=""><td>A=OLD DP</td></old<>	A=OLD DP
0055 3FCB 1F8B		TFR A,DP	SET DP
0056 3FCD 39	ST4	RTS	RETURN TO BASIC
0057 3FCE 0AFE		DEC <len2< td=""><td>DEC STRING2 LEN</td></len2<>	DEC STRING2 LEN
0058 3FD0 2706		BEQ SW5	IF =0 JUMP
0059 3FD2 0AFD		DEC <len1< td=""><td>DEC STRING1 LEN</td></len1<>	DEC STRING1 LEN
0060 3FD4 27D9		BEQ NOSWAP	IF =0 JUMP
0061 3FD6 20C3	SW5	BRA ST3	JUMP
0062 3FD8 0AFD		DEC <len1< td=""><td>DEC STRING1 LEN</td></len1<>	DEC STRING1 LEN
0063 3FDA 27D3		BEQ NOSWAP	IF =0 JUMP
0064 3FDC 20C5	MOVE	BRA SWAP	JUMP
0065 3FDE C605		LDB #5	B=COUNT
0066 3FE0 D7FB		STB <cnt< td=""><td>SAVE IT</td></cnt<>	SAVE IT
0067 3FE2 A605	MO1	LDA 5,X	SWITCH
0068 3FE4 E684		LDB ,X	LOCATIONS
0069 3FE6 E705 0070 3FE8 A780 0071 3FEA 0AFB			POINTED TO BY X DECREMENT COUNT
0072 3FEC 26F4 0073 3FEE 39 0074 3FEF 0000'	V1	RTS FDB O	IF CNT<>O JUMP RETURN
0075 3FF1 0000 0076 3FF3 0000 0077 3FF5 0000	V2 V3 LEN	FDB O FDB O	
0078 3FF7 0000	STP	FDB O	
0079 3FF9 0000	INT	FDB O	
0080 3FFB 00	CNT	FCB O	
0081 3FFC 00	NUM	FCB O	
0082 3FFD 00	LEN1	FCB O	
0083 3FFE 00 0084 3FFF 00 0085 4000	LEN2 OLD	FCB 0 FCB 0 END START	
CNT 3FFB INT LEN2 3FFE M01 NUM 3FFC OLD ST3 3F9B ST4 STP 3FF7 SW5 V2 3FF1 V3	3FF9 LEI 3FE2 MOV 3FFF ST 3FCE STS 3FD8 SWA	VE 3FDE NOSWA 1 3F69 ST2 5 3F95 START	3 F7 7

Listing 2

- 10 REM CLEAR STRING SPACE 20 REM & SET MEMORY SIZE
- 30 CLEAR200, &H3F62
- 40 REM POKE SORT ROUTINE
- 50 FORI=&H3F63 TO&H3FFF
- 60 READJ
- 70 POKEI, J
- 64 80-U.S. Journal

- 80 NEXTI
- 90 DATA134,63,30,139,151,255,15,252
- 100 DATA220,239,221,245,220,241,221,247
- 110 DATA220,243,221,249,158,247,166,132
- 12Ø DATA151,253,236,2,31,2,166,5
- 13Ø DATA151,254,236,7,31,1,3Ø,18
- 140 DATA150,254,39,6,150,253,39,28

DOSPLUS 4.0, the perfect Score. The DOSPLUS 4.0 hard drive system is here!

A hard drive without the dynamic new DOSPLUS 4.0 is like an eggshell without the egg. The new DOSPLUS 4.0 is the leading edge—the latest in the line of advanced disk operating systems from MICRO-SYSTEMS SOFTWARE, INC. It's the only current operating system written from the ground up for hard disk operation. Not just a driver but a fully developed system. What that means to you is more bang for your buck! Finally an unlimited TRS-80 for small business. For only '1899 you get the DOSPLUS "PLUS."

THE DOSPLUS 4.0 FEATURES

- Single volume addressing/Double sided flappies seen as one drive-one file can expand to limit of the hard drive
- Hard Disk—disk editing utilities
- Incredible I/O speed
- Runs any combination of densities or tracks
- Also operates 8" drives with special hardware—comes with expanded users guide and complete DOS technical section on I/O calls and DCB organization
- Ability to use hard drive as the "system" drive.

"PLUS" MANY OF THE SENSATIONAL NEW DOSPLUS 3.4 FEATURES

- BASIC array sort—multi key, multi array
- Tape/Disk—Disk/Tape utility (with relocator)
- Input (controlled screen input)
- Random access and ASCII modification on Diskdump
- BASIC checks for active "DO"
- · Backup and Format from a "DO" file
- Much improved Backup (More reliable)

TAKE YOUR MICRO TO THE MAX. ORDER NOW!

COMPLETE WITH 5 MEG SYSTEM.

- I/O package much faster (disk access time reduced)
- Repeat last DOS command with "/" [ENTER]
- · Short directory (filename and extension) available
- Short directory of Model III TRSDOS disks
- · Single file convert from Model III TRSDOS
- COMPLETE device routing supported (DOS and BASIC)
- Ability to save BASIC programs directly to another machines' memory (if equipped with DOSPLUS 3.4)

NOTE: The final versions of 3.4 and 4.0 will have almost identical features and documentation.

THE COMPLETE SYSTEM

- Smooth, silent, swift
- Error-free disk I/O
- *Add on up to 4, 10 meg units for a total of 40 megabytes!
- · Plugs on the 50 pin data bus.—no loss of floppy drives
- · Completely self-contained—just plug it in and go
- *10 meg units available Soon.

NOTE: Specify 40 or 80 track when ordering DOS diskette. After initial bootup, user can create any DOS desired.

The first in the industry backed by a lifetime warranty**

**Lifetime warranty an ariginal media



MICRO-SYSTEMS SOFTWARE, INC.

4301-18 Oak Circle Boca Raton, FL 33431 Telephone: (305) 983-3390 (800) 327-8724



BUY DIRECT

AT DISCOUNT PRICES

simple



Radio Shack TRS-80 Hard Drives Model I & III. . .from

TRS-80 Color Computer



PRICED

FROM

BUY DIRECT

TRS-80 Model II Computer

BUV DIRECT



PRICED I FROM

TRS-80 Model III Computer



BUY DIRECT

PRICED FROM

TRS-80 Model 16 Computer



PRICED FROM

Smith Corona TP-1 Daisy Wheel Printer



BUY DIRECT

PRICED FROM

IFR/ANKI **ACE 1000**



CALL FOR PRICES

ALL TRS-80'S ARE PURE RADIO SHACK EQUIPMENT

Write for our Consumer Discount Price List

Micro Management Systems. Inc.

PARCEL DIVISION - DEPT NO. 5

2803 THOMASVILLE ROAD EAST CAIRO, GEORGIA 31728

912-377-7120

37

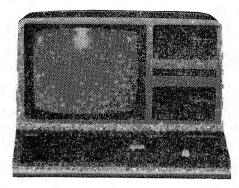
CC sorting _

- 150 DATA32,6,150,253,39,22,32,8
- 160 DATA166,128,161,160,39,45,37,12
- 170 DATA158,247,141,55,158,249,141,51
- 180 DATA134,1,151,252,204,0,5,211
- 190 DATA247, 221, 247, 204, 0, 5, 211, 249
- 200 DATA221,249,158,245,48,31,159,245
- 210 DATA38,178,150,252,38,160,150,255
- 220 DATA31,139,57,10,254,39,6,10
- 230 DATA253.39.217.32.195.10.253.39
- 240 DATA211,32,197,198,5,215,251,166
- 250 DATA5, 230, 132, 231, 5, 167, 128, 10
- 260 DATA251,38,244,57,0,0,0,0
- 270 DATAU, Ø, Ø

Listing 3

- 10 REM CLEAR STRING SPACE.
- 20 REM SET MEMORY SIZE,
- 30 REM SET USRO, &
- 40 REM DIM VARIABLES
- 5Ø CLEAR3ØØ.&H3F62
- 6Ø DEFUSRØ=&H3F63
- 7Ø DIMI(1Ø), I\$(1Ø)
- 80 REM INITIALIZE VARIABLES
- 90 FORI=1TO10
- 100 I(I)=I
- 110 READIS(I)
- 120 NEXTI
- 130 REM POKE POINTERS
- 140 I=VARPTR(I\$(1))
- 150 POKE&H3FF1, INT(I/256)
- 160 POKE&H3FF2, I-INΓ(I/256)*256
- 170 I=VARPTR(I(1))
- 180 POKE&H3FF3, INT(1/256)
- 190 POKE&H3FF4, I-INT(I/256)*256
- 200 REM POKE LENGTH
- 21ø I=9
- 220 POKE&H3FEF, INT(I/256)
- 230 POKE&H3FFØ, I-INT(I/256)*256
- 240 REM SET TIMER
- 250 TIMER=0
- 260 REM CALL SORT ROUTINE
- 270 I=USRU(0)
- 28Ø T=TIMER/6Ø
- 290 REM PRINT RESULTS
- 300 CLS
- 310 PRINT"SORT TIME: "T"SECONDS
- 320 PRINT: PRINT"ORIGINAL", "SORTED"
- 33Ø FORI=1TO1Ø
- 340 FORJ=1TO10
- 350 IFI(J)=I THENPRINTI\$(J),:GOTO370
- **360 NEXTU**
- 370 PRINTI\$(I)
- 380 NEXTI
- 390 DATAMARK, DENISE, RYAN, CANDY, GLENN, ROS
- EMARY, DAVID, GLORIA, LOWELL, BARBARA

4401 So. Tamarac Parkway, Denver, CO 80237 (303) 741-1778



MODEL III PRICE LIST

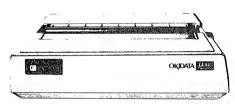
(All 48K with Tandon drives & the Apparat Disk Controller)

2 single sided 40 track drives	\$1895.00
2 dual sided 40 track drives	2145.00
2 dual sided 80 track drives	2395.00
with RS-232 C add	115.00

Price includes NEWDOS/80 & TRSDOS

NOTE: These Model III computers contain Apparat installed disk drives and memory. They are warranted by Apparat, Inc. for 120 days.





The printer with correspondence quality and data processing throughput! The 200 cps bidirectional ML 84 is the multi-mode printer you can afford. Okigraph™ dot-addressable graphics are standard. Six programselectable character sizes with true decenders, enhanced and emphasized print. The ML 84 proves top of the line doesn't have to mean top dollar. \$1125.00

SPOOL/64

Saving time, increasing productivity and lowering costs.

SPOOL/64, a 64K byte hardware print spooler, keeps your computer processing while your printer is printing. No more valuable time lost by waiting for a print run to finish.

This unit plugs directly into your personal computer and printer with one easy connection. It can then transfer up to 3,000 characters per second. The data is stored in the spooler's memory and sent to the printer at a rate the printer can accept. \$319.00

TANDON DISK DRIVES

Complete with power supply chassis & configured for TRS-80" Model Lor III

9	Single sided 40 track	\$28	5.0	0
8	Dual 40 or Single 80 track	\$41	5.0	0
0	Dual sided 80 track	\$51	5.0	0
•	Special - 2 Dual sided 80's	\$99	9.0	0
(A	dds almost 1.5 megabytes of sta	orana	to	2

NCWDQ58Q

double density model I or model III)

Version 2.0

The most sophisticated DOS ever produced for the TRS-80® Models I and III. It provides the user with "MAINFRAME" power on a "MICRO".

Some Features available are:

- Jobstream Control Language
- Mod I/Mod III Diskette interchangability
- Double Density Support on Model I
- Pagenation of BASIC listings on the screen
- Basic program single stepping Dynamic variable manipulation
- Multiple array sorts with BASIC CMD 'O'
- Complete technical support provided

All this plus much more for only

\$149.00

NEWTERM /80, MODEL III \$49.95

 Runs under popular operating systems
 Interrupt driven to 19,200 baud • Translation table • Automatic sign-on • Status line

CHEXTEXT®, \$59.95 "Surefire Spelling Checker"

See Desktop Computing Sept. '82 issue, p. 52-53 for review. . . . "Chextext, a program that avoids the limitation brought about by hashing/since it retains the integrity of the words . . . The dictionary, or any part of it, may be displayed on the screen."

FLEXTEXT/PLUS, \$34.95

For the Mod I & II for all EPSON printers with GRAFTRAX/PLUS

CREATIVE CUISINE, \$29.95 Electronic Cookbook

InfoWorld Software Report Card *NEWDOS/80* Version 2.0 Performance

Ease of Use Error Handling 🔲 🗎 🖸 MEAL MASTER, \$24.95

Meal planning & grocery shopping aid

UNITERM/80, \$89.00

Universal terminal program that takes advantage of the extended NEWDOS/80 commands

MICRO CLINIC, Mod I \$24.95, Mod III \$29.95 The ultimate in memory & disk diagnostics

APPARAT'S PROM BLASTER

An eprom programmer for most 25 X X and 27 X X chips, TRS-80 MOD | & III.....\$119.00 Cable17.95 Bus Extender......69.95

MODEL I DOUBLE DENSITY PACKAGE

Converts a standard TRS-80 Model I to Double Density Apparat Doubler & NEWDOS/80 V 2.0. \$278.00 value for only \$219.00

Doubler alone \$129.00

38

Scripsit® & TRS-80® are registered trademarks of Tandy Corporation Freight F.O.B. Denver, call for shipping charges. Foreign Orders shipped Air Freight

Basically BASIC

String functions and what they can do

For all models

James A. Conrad, Seattle, WA

Most novice, and many not-so-novice programmers don't understand much about string functions. Functions seemed relatively unimportant when they started learning BASIC — something to "get to later." Well, "later" is now. String functions are easy to understand.

Many programmers tend to confuse *functions* and *statements*. A *statement* is an instruction to the computer, telling it to do something. It contains (or is) a verb such as PRINT or GOTO. Most *functions* calculate or convert. They're like self-contained subroutines; LOG(x), for example, computes the natural logarithm of x.

The major BASIC functions perform arithmetic or string operations. String functions analyze and manipulate strings. They're indispensable in input checking and output formatting routines.

A Few Words About Functions

A function has two parts — a title and an argument. The title describes, in BASIC, what the function does, e.g., LENgth, VALue. The argument is the input to the function. The function takes this input and returns a result. The parentheses following the title contain the argument. They are pronounced of — the function LEN(A\$), for example, is pronounced "length of A string."

You can do almost anything with a function that you can with a variable. You can print it. You can add or subtract it (if it's numeric). You can even put it in the argument of another function — this is called "nesting" — e.g., LEN(MID\$(A\$,3)). (When you nest functions be sure that you've put in a right parenthesis for every left one.) About the only thing you can't do with a function that you can with a variable is assign a value to it with

an assignment statement.

The String Functions

Here's a summary of string functions, what they do, and a program line that prints an example. The symbols used in the arguments are:

\$: String being analyzed.

sub\$: Substring.

len: Length of substring to be returned (0 - 255).

pos: Position in string.

x: Any numeric expression or number the computer can handle.

chr: Character (in quotes) or ASCII, control or graphics code.

asc: ASCII, control or graphics code (0 - 255).

Any of these (except chr) can be a constant, variable or formula.

We'll use line 10 to make a 9-character string, A\$, to play with:

10 A\$ = "123456789"

LEFT\$(\$,len)

Returns the left *len* characters of string \$.

20 PRINT "THE FIRST 4 CHARACTERS OF A\$ ARE: "; LEFT\$(A\$,4)

It prints 1234.

RIGHT\$(\$,len)

Returns the right len characters of string \$.

30 PRINT "THE LAST 3 CHARACTERS OF A\$ ARE: "; RIGHT\$(A\$,3)

This prints 789.

68 80-U.S. Journal

MIDSTRING(\$,pos,len)

Returns a substring of string \$, beginning with character number pos and having a length of len characters.

40 PRINT "CHARACTERS 2, 3, AND 4 OF A\$ ARE:"; MID\$(A\$,2,3)

This time, 234 is printed.

MIDSTRING(\$,pos) (len omitted)

Returns the entire substring right of position pos.

50 PRINT "RIGHT SIDE OF A\$ FROM 5 ON IS: "; MID\$(A\$,5)

Now it prints 56789.

LEN(\$)

Returns the number of characters in string \$.

60 PRINT "NUMBER OF CHARACTERS IN A\$ IS: "; LEN(A\$)

This shows 9.

VAL(\$)

Returns the numeric value of string \$.

70 PRINT "THE VALUE OF A\$ IS: "; VAL(A\$)

We get 123456789. (Note that the first position is a space.)

STR\$(x)

Converts a number or numeric expression (x) to a string.

80 LET A = 333

90 PRINT "THE STRING OF A IS: "; STR\$(A)

This prints 333. (The first position is a space and the length of the string is 4 characters.)

STRING\$(len, chr)

For this the Color Computer requires Extended BASIC. Returns a string of character *chr* which is *len* characters long.

100 PRINT STRING\$(20, "=")

Prints a double line 20 characters long:

110 PRINT STRING\$(20, 61) : REM 61 is ASCII code for "=" $^{\prime\prime}$ "

Prints the same double line.

INSTR(pos, \$, sub\$)

This command is on Disk Models I and III or the Extended Color Computer. Searches string \$ beginning at position pos for substring sub\$. Returns position number if found, 0 if not found. If pos is omitted, search begins at first character (pos. 1).

120 PRINT "POSITION OF 56 IN A\$ IS: ";: INSTR(1, A\$, "56")

This prints 5 — the substring 56 begins at the 5th position in A\$.

ASC(\$)

Returns ASCII code number of the first character of string \$.

130 PRINT "A\$ BEGINS WITH ASCII CHARACTER # "; ASC(A\$)

Prints 49 — the ASCII code for 1. Printing ASC("1") will also return 49.

CHR\$(asc)

Returns the character, in a one-character string, for ASCII, control or graphics code *asc*.

140 PRINT "THE CHARACTER FOR ASCII CODE 49 IS: ": CHR\$(49)

This prints 1.

Workhorses

The LEFT\$, RIGHT\$ and MID\$ functions are the workhorses of string manipulation. And they're easy to understand. Run this quick FOR...NEXT loop for a display of their operation:

10 B\$ = "ABCD"

20 FOR X=1 TO 4

30 PRINT LEFT\$(B\$, X)

40 NEXT X

Printing this, we see that as X increases, the printed string changes:

When X is	The screen shows
1	Α
2	$\mathbf{A}\mathbf{B}$
3	ABC
4	ABCD

Now change line 30 to: 30 PRINT RIGHT\$(B\$, X). We get:

When X is	The screen shows
1	D
2	$^{\mathrm{CD}}$
3	BCD
4	ABCD

Try another change: 30 PRINT MID\$(B\$, X, 2). Now:

When X is	The screen shows
1	$\mathbf{A}\mathbf{B}$
2	$_{ m BC}$
3	$^{\mathrm{CD}}$
4	. D

We've briefly examined the string functions and what they do. Next time we'll use them to manipulate strings.

One of my many idiosyncrasies (some people call them symptoms of my insanity) is having a lot of fun playing with strings and string functions. They're easy to learn. The more you experiment with them, the more innovative you'll make your programs. That's BASIC.

Tandy topics

Ed Juge, Director, Computer Merchandising 1500 One Tandy Center, Fort Worth, TX 76102

Summer is really over in Texas. This morning, it was 55 degrees. A couple of times each week, we're seeing a hot air balloon drifting across the morning sky. Seems to be the same one each time. I think I need a job like his! I can't help wondering where he finds a chase crew to pick him up when he lands. Oh, well . . .

Since you're reading this in December, I thought I'd "tie up" the year by telling you a little bit about our internal structure, and the folks who have worked all year to bring you TRS-80 products. For those of you who have asked, here's a thumbnail sketch.

The Fort Worth staff people responsible for the TRS-80 product line are broken into three main groups: computer merchandising, hardware engineering, and software development (the latter two being part of our research and development department). Of course, in the support area, we have computer customer services, technical support, and national parts. Many others are involved, so I've named those you're likely to hear a little more of.

We've told you that we buy a lot of software from outside sources. Even so, we have a large software team of **70** 80-U.S. Journal

analysts, programmers, testers and writers. There are project managers, who supervise development teams specializing in specific types of software. They also work with outside software vendors on the forty to fifty percent of our software which comes from third parties. There are two major divisions in the group, for systems and applications software. All software goes through extensive testing, and manuals written outside are edited by our internal staff.

Our hardware engineering staff includes groups who specialize in specific areas of hardware. They have their own group of writers for hardware manuals.

Computer merchandising includes our computer buyers (a more common industry title is product managers), software product planners, newsletter staff, the group who writes our computer center training material, and our new third-party software vendor support function. Product planning, direction, promotion and advertising are the primary department functions. Merchandising also includes a sizable software Q/A group.

Customer services is the group you're most likely to come in contact

with. We've recently put about 150 customer service representatives in selected computer centers, to serve you faster and better on a local basis. There is still a very large group here in Fort Worth to answer your (and our field folks') questions and problems. They also keep our stores updated on patches and fixes to all software items. They answer a tremendous number of phone calls. and do an outstanding job! No, they won't always have an instant answer for a just-reported problem, nor can they help you with "custom" programming or hardware questions: "How do I hook a brand xyz printer to my TRS-80?" We just can't know all of the combinations, and this is a type of information we aren't staffed to supply.

In Fort Worth, there are five computer factories, including one exclusively for software. We also have one warehouse here devoted exclusively to computer products. Our computer operation is supported by many other departments, including national quality assurance, advertising, data processing, personnel, and others.

Although in many ways we're highly self-sufficient, make no mistake that we recognize and appreciate all of the non-Radio Shack vendors who support our

+ \$1.50 Shipping, CA add 6% specify Mod I or III

Space Frontier

ACCEL3 compiles big programs, 30K +. This is by design; subset compilation and use of ROM routines keeps code growth low (and ensures the highest compatibility with the BASIC source program). Also, the NOEXPR can limit option compilation to the program flow operations (GOTO, GOSUB. RETURN, FOR-NEXT, IF, ON) over part of your program, or in toto. 5.5K, all DOS.

Full-Screen Editor for TRS-80 Basic, Mod I/III

You need better-than-wordprocessor control when you write and edit BASIC programs. That's why EDIT has lots of better-thanwordprocessor features.

- Full-floating cursor with autorepeat
- Navigation by cursor-controlled scrolling, by line number or by program content. Overtype, Delete or Insert characters
- of text (including line numbers).
- Join or Split lines. Copy, Delete, Insert, Move, Position or Replicate lines. Copy, Delete, Move, Position or Replicate blocks of lines.
- Find and/or Replace occurrences of strings.
- Over 30 commands and functions, supports 3.3K, relocatable (all DOS), also includes TRSDOS, LDOS overlay version.

You owe it to your programming.

+ \$2 Shipping, CA add 6% specify Mod I or III

ACCEL4, overlay version of ACCEL3, works with TRSDOS, LDOS only, no user memory requirements. Anyone for 40K + compilations?

You owe it to your programs.





NEW

Southern Software's NEW relational database manager. Integrated data dictionary, recursive command structure, more. \$140

Developed in England by Southern Software.

TRS-80, TRSDOS, tm Radio Shack LDOS, tm Logical Systems

products. We can't do it all, and we couldn't make the TRS-80 nearly as useful to as many people without those fine folks!

New, Fast-Order System

I'd like to tell you about a change we're making, to serve you better than before with products. As any of you know, who have ever been involved in inventory control, a retail business can't stock items which move slowly, and stay in business very long. Every so often, you have to review your sales, and see what is and isn't moving, and drop slow-moving items. Yet, as a computer user, you know you'd always like to see us with even more products to choose from.

Well, we recently reviewed our computer line, and found some likely candidates for discontinuance, yet we know that many of them are darned near indispensable to those of you who do need them. So, we came up with a plan.

We took a number of "slow, but

necessary" items and created a new "fast-order system". We won't carry those items in our stores (any stores) any longer. But your local store can take a deposit and order them for you through their daily computer tiein with Fort Worth. Your order will be shipped the following day! Frankly, these items move slowly enough that most stores wouldn't have stocked them anyway, so a special order would have been necessary. Normal warehouse shipments to stores are done on a cyclical basis, so the new system could literally save weeks, if your order reached our warehouse out of cvcle.

Will you notice the lack of those items in the stores? Doubtful! They total less than one percent of our sales. Now, the other good news is that this system will allow us to make available some new items which we couldn't have considered in the past because we knew they would be slow sellers. Fast orders started October 1, and we think

they're going to improve our ability to supply your needs.

The New Year

I really wish I could tell you about some of the things we have planned for 1983, but it's a little premature. In lieu of that, how about a prediction? 1983 will be one of the most exciting years we've had for TRS-80s!

I had a visit from Mike Schmidt and Cam Brown yesterday, and they're planning some changes in 80-U.S. Journal for '83, too — very positive changes. If you have a friend who is a TRS-80 owner and isn't getting 80-U.S., tell him (or her) to write to Mike and ask for a free sample copy. Tell Mike it's the free sample he promised Ed Juge he'd supply.

Now that I've done my bit to increase Mike's expenses, I'll get out of here by just wishing everyone a very, very happy holiday season and prosperous new year. See you in 1983. ■

ALL HARDWARE Model I Lowercase

MOD I/III SPEED MOD

The only resource you can't replace is TIME. PLUG IN A SPRINTER (by Holmes Engineering) and

TRIPLE THE SPEED of your TRS-80 MODEL I OR MODEL 3.
YES! A NEW Z-80B MICROPROCESSOR IS INCLUDED!
YES! Special circuitry handles your slower memory chips.
YES! Automatic switch down to "normal" for disk I/O.
YES! IT IS ABSOLUTELY FANTASTIC and only 99.50 COMPLETE!!
Only the cream of the crop - - for you, from HACKS.

SCRIPLUS v3.0 (by ROSTEK) is the software "patch" for SCRIPSIT (c) that lets you output control codes to CHANGE TYPE STYLES, UNDERLINE, etc. from within your text files. Written especially for the MX-80 but works fine with most any printer that accepts control codes. Makes your printer do all the tricks it was designed for. +DIR, KILL, MERGE, and MORE, WHILE IN SCRIPSIT (c).

How many times have you wished? Here 'tiz ON DISK 39.95

Need a SUPERFINE lowercase CHARACTER GENERATOR for your MOD 1? KSG Technology builds 'em, and we've got one just for you. Beautiful lowercase -FULL DECENDERS - All of the graphics, of course. INCLUDES the SPECIAL GRAPHICS for CHR\$(0) thru CHR\$(31) omitted in the later Radio Shack lower case chips. Ask for the CGA-2. You'll love it! Only 29.95

Did you ever bomb a disk? SUPER UTILITY (by Kim Watt) WILL AUTOMATICALLY RECOVER BOOT SECTIONS, GAT TABLES, READ AND COPY PROTECTED MEDIA, TRANSFER FROM ONE DOS TO ANOTHER, SINGLE OR DOUBLE DENSITY, and on, and on, and on... You just wouldn't believe... Includes a hundred and some odd vital functions. The BEST (no doubt!) and very, very highly recommended for ANYONE that uses a TRS-80 MOD 1 or MOD 3 with any kind of DISK and any kind of DOS. You just got to use it to realize what you've got here! The name "SUPER UTILITY" is a gross under-statement. One use can easily pay for the program. 48K required. Specify 35tk, 40tk or 80 tk media for your Mod 1 or Mod 3. Absolutely professional! You need this! Don't get caught without it. 74.95

DUALCASE

UPPER/lowercase, full time from power-up; NO software; Standard typewriter keyboard operation (shift to UPPER-CASE); Control characters can be displayed; 128 Total character set plus full graphics.

ELECTRONIC SHIFT-LOCK

No extra keys or switches. Simply tap either shift key, UPPER-CASE lock. normal shift unlocks.

DE-B-BOUNCE At no extra cost (At your option)

BLOCK CURSOR If you like (No chg) **SWITCHABLE** from key board



"THE PATCH" is covered with a one year limited warranty on materials and workmanship. (Does void Radio Shack's 90 day warranty.)

"THE PATCH" is a trademark of CECDAT.INC.

"THE PATCH" is compatible with any word processor, any DOS and also other languages which use ROM subroutines Assembled and tested \$127.00

"THE PATCH" unit plugs into the ROM sockets (does not replace existing ROM). Lowercase does require installation of the extra video ROM (supplied with "THE PATCH")

Detailed instructions guide even the most inexperienced owner to complete installation in about 30 minutes.

WHEN ORDERING SPECIFY:
"Mem Size"
"Memory Si

"Mem Size" \square "Memory Size" \square And your choice of any/all options.

To order, send payment plus \$2.00 shipping and handling. Texas residents add 5% sales tax/

WHEN ORDERING SPECIFY:

"Mem Size" ☐ "Memory Size" ☐ Any your choice of any/all options

To order, send payment plus \$2.00 shipping and handling. Texas residents add 5% sales

HACKS

P.O. BOX 12963 Houston, Texas 77017

National Distributors

713-455-3276

BASIC bits

Packing strings efficiently

Model I/III, PMC-80, LNW80

Thomas L. Quindry, Burke, VA

Last month the simplest form of string packing for BASIC programs was illustrated. To recount, the string variables, A\$ and B\$, were packed with graphic values read from data statements and concatenated using the form, A\$ = A\$ + CHR\$(A), where A is the latest value read from the data statements given.

While this method works, it is probably one of the most archaic ways of packing a string. If much string packing takes place, noticeable time will be lost due to the constant redefining of the string A\$ for each successive concatenation of values. As you will remember, the garbage collection routine is the culprit.

There are much easier ways to pack strings. They avoid the garbage collection routine of your computer because the computer has nothing to sort. Many people don't realize that if a string function is defined within a BASIC program, it will not be sorted when the computer goes into its string function garbage collection routine. Let's say our BASIC program defines A\$ to be the word STRING. It can be defined either in a data statement such as DATA STRING, which is later read and interpreted to a string variable (READ A\$), or in the form A\$ = "STRING."

In the above example as long as A\$ is not redefined to another value, the VARPTR for A\$ will help us find the word STRING, which appears in your BASIC program. You don't have to CLEAR string space when defining strings of this type either. Since the operating BASIC program is a permanent fixture in RAM, there is no need to reserve extra space for these string functions, which are currently a part of the program. They already have a place in memory which will not be redefined. BASIC program statements are not redefined while running them.

Well, almost not redefined! The all-powerful POKE function, used with the just as powerful VARPTR function, can redefine strings in your BASIC program without affecting operation (when used carefully). Since repetition is one of the best ways to prove a point, consider last month's program called Animate. That example illustrated the packing of graphic characters in

a string to display men jumping on the video screen. Instead of doing what we did last month, another way to define the strings, A\$ and B\$, is given in Listing 1.

I have rewritten Animate so that it performs the same as last month, but does so in a slightly more efficient manner. Notice that the CLEAR 93 command given last month is omitted. Replacing it are dummy string values of thirty-one characters each for A\$ and B\$. The graphic character values and control codes are still given in data statements, but the CHR\$ function is no longer used. Instead of defining the strings as we did last month, the strings are already defined. Each string is defined as a word of thirty-one bytes. These words are dummy words.

Using this method of string packing, we must reserve space for the final graphic character. Since each graphic character of the jumping man will have thirty-one characters as it did last month, we have to reserve thirty-one spaces. Instead of spacing over thirty-one times between the quote marks, the easiest way to do this is to count with numbers. We could count 12345678901234... or, as I like to do, leave a space in place of each of the zeroes (123456789 1234...). The spaces are easier to see and help in the counting.

Now comes the VARPTR function. The VARPTR function helps to locate the position of variables. With string variables such as A\$, VARPTR(A\$) will point to an address which tells the length of the string. That address is followed by two bytes which give the address of the string in memory, whether it be in your BASIC program or reserved string space saved by the CLEAR function. Addresses are saved in the form: Least Significant Byte (LSB) first, then Most Significant Byte (MSB). We use the value (VARPTR(A\$)+1 + (VARPTR(A\$)+2)*256) to calculate the address of our string variable.

Now that we know where the string is, we can use the POKE function to substitute values from our data statements into the reserved area. This is done in lines 80 through 110 and 290 to the end of the program. Just run the program once and the string areas will be redefined.

The beauty of this method of string packing is that once we have run our program, we have redefined our program to include the final graphic strings, A\$ and B\$. We have no use now for the routine and the data statements used in redefining it. We can delete the line numbers stated in the previous paragraph and do anything we want to the remaining part of the program. We can CSAVE it, CLOAD it, SAVE or LOAD it to disk. We can even add BASIC program statements before or after the program lines containing the redefined strings, or merge it with another program.

If you have keyed in the program from Listing 1 and run it once, you will notice something out of the ordinary when you list the program. Those with a Model I will see a series of BASIC words and spaces, within the quote marks of lines 40 and 50, which define A\$ and B\$. Each string takes four lines to be defined. If you command your computer to PRINT A\$,B\$, you will see the two positions of the graphic character (the man) we have defined.

This discrepancy is because of the way the Model I BASIC interpreter works. With both the Model I and III, each BASIC word is tokenized. These tokenized words share the same ASCII character as the graphic blocks. When listing a program line, the Model I tokenizes each word to be displayed, including those graphic characters which have been packed into a string function. The Model III is a little smarter. It only

tokenizes those ASCII characters which fall within the command line of the BASIC statement. On the Model III, you will see the graphic characters when you list lines 40 and 50.

Delete the lines, mentioned before, that are no longer needed. When you run the program, you will notice that there is no longer a pause before the men appear on the screen and start jumping.

Next month, I'll finish up string packing with some hard, fast rules for packing machine code. Also, I'll tell you about one other machine code packing technique and give you an example.

Question: Can I reset the memory size on my computer without turning it off?

Answer: Assuming that you don't want to save a BASIC program in residence, enter the SYSTEM command and respond to the *?- with "/0." This reinitializes the computer as if you had just turned it on. Then, you can enter the memory size. I have used another way which is convenient if you want to save your BASIC program in memory. POKE the new memory size you wish to save, minus two bytes, into locations 16561 and 16562. This requires a knowledge of hexadecimal addressing and is similar to what we have been doing with LSB and MSB bytes for the VARPTR function in the example of Animate.

Remember to send your questions and tips to me, care of 80-U.S. Journal, 3838 South Warner Street, Tacoma.

Marymae industries, inc.-

In Texas, Orders, Questions & Answers 1-713-392-0747

22511 Katy Freeway Katy (Houston), Texas 77450 To Order 1-800-231-3680 800-231-3681

SAVE BIG DOLLARS ON ALL TRS-80° HARDWARE & SOFTWARE

TRS-80° by Radio Shack. Brand new in cartons delivered. Save state sales tax. Texas residents, add only 5% sales tax. Open Mon-Sat. 9-6. We pay freight and insurance. Come by and see us. Call us for a reference in or near your city. Ref: Farmers State Bank, Brookshire, Texas.

WE OFFER ON REQUEST

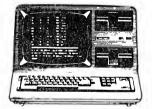
Federal Express (overnight delivery)

Houston Intercontinental Airport Delivery, Same Day Service

U.P.S. BLUE-Every Day

References from people who have bought computers from us probably in your city. We have thousands of satisfied customers. WE WILL NOT BE UNDERSOLD!

ED McMANUS



In stock TRS-80 Model

No Tax on Out of Texas Shipments!

Save 10% 15% OR MORE

Reserve your Model 16 Today! TELEX: 77-4132 (FLEXS HOU)

WE ALWAYS OFFER

- NO extra charge for Master Card or Visa
- We use Direct Freight lines. No long waits
- We always pay the freight and insurance
- □ Toll free order number
- Our capability to go to the giant TRS-80® Computer warehouse 5 hours away, in Ft. Worth, Texas, to keep you in stock.
 - ® TRS-80 is a Registered Trademark of Tandy Corp.

JOE McMANUS

41



WA 98409. Send a self-addressed stamped envelope and I'll try to give you a personal handwritten reply as long as the answer is not too long and involved.

Program Listing for BASIC Bits

- 1 'BASIC BITS #3 LISTING NO. 1
- 10 'ANIMATE BY THOMAS L. QUINDRY
- 20 'AN EXAMPLE OF AN EFFICIENT STRING PA CKING
- 30 'TECHNIQUE FOR ANIMATED GRAPHIC STRIN G CHARACTERS
- 4Ø A\$="123456789 123456789 123456789 1"
- 5Ø B\$="123456789 123456789 1"
- 60 CLS
- 70 PRINT@256, "THIS IS AN ANIMATION OF ME N JUMPING"
- $8\emptyset X = VARPTR(A\$)$
- 90 GOSUB 370
- 100 X = VARPTR(B\$)
- 110 GOSUB 370
- 120 PRINT@ 450,A\$;
- 130 PRINT@ 455,A\$;
- 140 PRINT@ 460,A\$;
- 150 PRINT@ 465,B\$;
- 160 PRINT@ 470,A\$;

- 170 PRINT@ 475,A\$;
- 18Ø FOR N=1 TO 100
- 190 NEXT
- 200 PRINTO 450,B\$;
- 210 PRINT@ 455,B\$;
- 220 PRINTO 460,B\$;
- 23Ø PRINT@ 465,A\$;
- 24Ø PRINT@ 47Ø,B\$;
- 250 PRINT@ 475,B\$;
- 260 FOR N=1 TO 100
- 27Ø NEXT
- 28Ø GOTO 12Ø
- 290 DATA 128,176,144,128,26,24,24,24,24
- 300 DATA 180,187,177,148,26,24,24,24,24
- 310 DATA 128,159,149,128,26,24,24,24,24
- 320 DATA 130,129,131,128
- 330 DATA 128,175,133,128,26,24,24,24,24
- 340 DATA 135,191,151,133,26,24,24,24,24
- 350 DATA 128,149,149,128,26,24,24,24,24
- 360 DATA 128,128,128,128
- 370 X = PEEK(X+1) + 256*PEEK(X+2)
- 380 FOR N=X TO X+30
- 39Ø READ A
- 400 POKE N.A
- 410 NEXT
- 420 RETURN .

A NEW ANGLE

ON TAPING!

EASY SLIP-ON

INSTALLATION

RECORDER ANGLE

⋄ VINYL TIPS

PLATED SPRING STEEL

ADJUSTABLE

SINDSK. WE'VE PUT SENSE IN

RELIABLE LOW-COST HIGH-SPEED TAPING

C-LEGS

NO-FUSS HIGH SPEED SOFTWARE

(Mod 1, 4k to 48k)

KWIK Cassette Operating System for Mod 1. The easy-to-use Level II enhancement for reliable fast taping (select 1000-3000 baud). Features: save, load, verify, search, chain-load, catalog, and testread of both BASIC and machine-code programs . . . plus: long pgm names, passwords, debounce, slow 'list', self 'backup', and more.

KOS3 (Mod 3, 16k to 48k)

The KWIK Cassette Operating System for Model 3. All KWICOS. features at 2200 baud, plus KWIK set of: clock display, Time, Date, Cassette high/low, I/O routing, etc.

(specify Model)

Mini-system for BASIC programs only. EasyLoad 1000 baud for Mod 1, 2200 baud for Mod 3. Many 'KWICOS' features.

KWINK (Model 1, 4k-48k)

\$15 Makes stand-alone fast-loading (2x-6x) copies of any standard 500 baud "SYS-TEM" program. (At 6x, 3 minute program loads in 44 sec!)

KLOAD (Model 1)

\$15 Similar to 'KWINK', but for BASIC pgms only. (Specify 16-32-48k)

KLOAN (Mod 3, 16k-48k) Makes 500 or 1500 baud copy of any other standard 'system' pgm.

KWIK Software

Rox 328 Bolivar, MO 65613 Phone (417) 326-7154

\$2.99 with order from either company Otherwise \$4.99 ppd CTR80/80A # 42

NEW

CASSETTE EJECTS

INTO YOUR HAND

PUTS COUNTER 4

IN FULL VIEW

TAKES LESS

TABLE SPACE

NO-FUSS ANY-SPEED HARDWARE The amazing LemonAid Loader takes the 'finickies' out of Model I

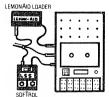
loads, but even more amazing . . . make KWIK copies of your Model I programs and load them flawlessly at 6× speed! Instant installation . . . simply plug between your cable and recorder. No internal batteries or external power needed.

New Model LLQ-2 Deluxe loader has volume controlled jack for tape listening without plug-pulling, using external speaker/earphone. Ideal for Model I, compatible with Model III. ppd \$21.99.

New Model LQ-2 loader. Built-in low level audio monitor with fixed volume. Model I, Mod III compatible. \$18.99

Model LL-1. Great little economy loader for the Model I. \$14.99

Model LSS. Solid state SOFTROL (1) eliminates switch-hits. (2) Push button and slide switch control of CTR motor makes tape positioning a snap without plug pulling. (3) Cushioned motor-off delay pulls end of programs past CTR pinch rollers...no pinch-hits, plus (4) automatically gaps between saved programs. For all standardplug recorders and computers. \$18.99



LEMONS

325 N. Hwv 65 P.O. Drawer 429 Buffalo, MO 65622 (417) 345 7643



Call either number 'til 10 pm most any day for info or order US orders postpaid, add \$3 for COD or overseas Missouri residents add sales tax

Files and foibles

Sorting large sequential files

Models I/II/III, PMC-80, LNW80

T. R. Dettmann, Associate editor

This series has been primarily concerned with random access files and techniques. But people with sequential file systems have real concerns as well. The current problem is one that faces many people with mailing lists or other data bases that are maintained as sequential files: How do we sort when there are too many items to sort in memory?

For example, several years ago, a friend was maintaining a 25000-name database on a TRS-80 Model I with five inch disks! Imagine the problem of combining those files into a mailing list sorted by zip code.

Most people have taken to structuring their data into separate files, each of which can be sorted. However, this means that sorting can't be done on very large combined files in ways other than the original structuring.

How about having a file the size of a single disk and then sorting it? It can be done, if you have disk space for temporary files, by using a "sort/merge" technique. The same technique can also be used (by leaving out the sort) to merge a set of files.

The basic idea of the sort/merge operation is to take small steps and accomplish it little by little. For very large files, you may have to let it run for awhile, but you could restructure a whole database with this technique.

To see how a sort/merge works, let's look at it as a series of simple steps:

1. Open the input file.

2. Split the input file into smaller files by reading as many items as possible, sorting them and writing the sorted items out to one of the smaller files.

3. Merge the files by opening some of the smaller files, reading the first item from each, then writing the smallest to the output file. Read another item from the file where the smallest item was.

The basic operation sounds very easy. For the most part it is, but there are some interesting complexities that one has to deal with to make it work right.

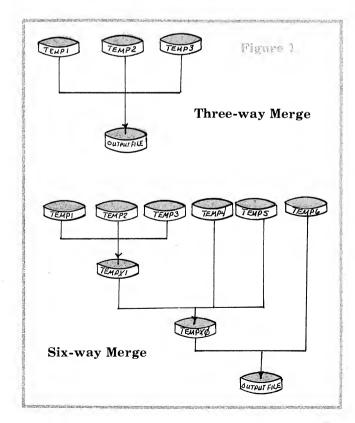
To see how to do a real sort/merge operation, let's look at the sample program. In lines 10-150, we initialize the program. The important part of this is in lines 110-130. In line 110, we set up a set of parameters for the program which make it quite flexible. The first, NL is the number

of lines to read into memory for sorting. The sample program limits it to ten for the demonstration, but you would normally set it to 400-600, depending on your program.

Parameter NFL is the number of files that will be declared in entering BASIC. I used four so that I could merge three files into one. You could use up to sixteen if you wanted.

Parameter NX is the maximum number of temporary files to generate. Since a list of these files is kept in memory (not absolutely necessary), this will serve as the dimension of the array which remembers their names.

Line 120 sets up the line array (LN\$), the temporary filename list (FF\$), and the merge file list (FC\$). The root of the temporary filename is set to TEMP and the number of the current temporary file is set to zero.



76 80-U.S. Journal

QUALITY SOFTWARE FOR TRS-80 COLOR AND OSI ADVENTURES AND QUEST ALSO FOR SINCLAIR AND VIC-20



ADVENTURES!!!

For TRS-80 COLOR and OSI. These Adventures are written in BASIC, are full featured, fast action, full plotted adventures BASIC THAT ZOOOMMS!! that take 30-50 hours to play. (Adventures AT LAST AN AFFORDABLE COMPILER FOR are inter-active fantasies. It's like reading OSI AND TRS-80 COLOR MACHINES!!! The a book except that you are the main char-

Adventures require 16k on TRS80, TRS80 color, and Sinclair. They require 8k on OSI and 13k on Vic-20. Derelict takes 12k on OSI. \$14.95 each.

ESCAPE FROM MARS

(by Rodger Olsen)

This ADVENTURE takes place on the RED PLANET. You'll have to explore a Martian city and deal with possibly hostile aliens to survive this one. A good first adventure.

PYRAMID (by Rodger Olsen) This is our most challenging ADVENTURE. It is a treasure hunt in a pyramid full of problems. Exciting and tough!

TREK ADVENTURE (by Bob Retelle) This one takes place aboard a familiar starship. The crew has left for good reasons but they forgot to take you, and now you are in deep trouble.

HAUNTED HOUSE (by Bob Anderson) It's a real adventure - with ghosts and ghouls and goblins and treasures and problems but it is for kids. Designed for the 8 to 12 year old population and those who haven't tried Adventure before and want to start out real easy.

DERELICT

(by Rodger Olsen & Bob Anderson) New winner in the toughest adventure from Aardvark sweepstakes. This one takes place on an alien ship that has been deserted for a thousand years - and is still dangerous!



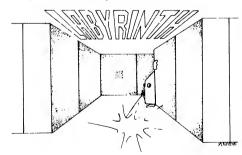
VENTURERI-A fast action all machine code Arcade game that feels like an adventure. Go berserk as you sneak past the DREADED HALL MONSTERS to gather treasure in room after room, killing the NASTIES as you go. Great color, high res graphics, sound and Joystick game for the TRS-80 Color or OSI machines. (black and white and silent on OSI.) Tape only, \$19.95.

AT LAST AN AFFORDABLE COMPILER FOR compiler allows you to write your programs in QUEST - A NEW IDEA IN ADVENTURE acter as you give the computer commands easy BASIC and then automatically generates a like "Look in the Coffin" and "Light the machine code equivalent that runs 50 to 150 machine code equivalent that runs 50 to 150 Quest is played on a computer generated times faster.

> It does have some limitations. It takes at least 8K of RAM to run the compiler and it does only support a subset of BASIC-about 20 commands IF, THEN, RETURN, END, PRINT, STOP, USR life or death battle to the finish. Playable (X), PEEK, POKE, *, /, +, -, >, <, =, VARI-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. 16k TRS-80, TRS-80 Color, and Sin-ABLE NAMES A-Z, SUBSCRIPTED VARI-LIFE time. ABLES, and INTEGER NUMBERS FORM 0-64K. clair. 13K VIC-20. \$14.95 each.

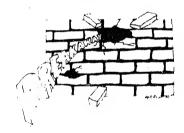
TINY COMPILER is written in BASIC. It generates native, relocatable 6502 or 6809 code. It comes with a 20 page manual and can be modified or augmented by the user. \$24.95 on tape or disk for OSI or TRS-80 Color.

LABYRINTH - 16K EXTENDED COLOR BASIC - With amazing 3D graphics, you fight your way through a maze facing real time monsters. The graphics are real enough to cause claustrophobia. The most realistic game that I have ever seen on either system. \$14.95. (8K on OSI)





GAMESI Different from all the others. map of Alesia. Your job is to gather men and supplies by combat, bargaining, exploration of ruins and temples and outright banditry. When your force is strong enough, you attack the Citadel of Moorlock in a



BREAKAWAY - ALL MACHINE CODE -Every computer has some form of BREAK-AWAY available. Ours is fast, smooth, has 15 levels of difficulty - and is a bargain! 16k TRS-80 Color only \$9.95.

PROGRAMMERS!

SEE YOUR PROGRAM IN THIS SPACE!!
Aardvark traditionally pays the highest commissions in the industry and gives programs the widest possible coverage. Quality is the keyword. If your program is good and you want it presented by the best, send it to

Please specify system on all orders

ALSO FROM AARDVARK - This is only a partial list of what we carry. We have a lot of other games (particularly for the TRS-80 Color and OSI), business programs, blank tapes and disks and hardware. Send \$1.00 for our complete catalog.



AARDVARK - 80 2352 S. Commerce, Walled Lake, MI 48088 (313) 669-3110

Phone Orders Accepted 8:00 a.m. to 4:00 p.m. EST. Mon.-Fri.



TRS-80 COLOR

SINCLAIR

OSI

VIC-20

ACE



Computer Rentals

With Discount Purchase Options

★ COMPUTERS

Apple, Franklin, TRS-80 Model I/II/III, PMC, NEC, Heath, Others pending

★ SOFTWARE

Legal-professional, Utility, Personal, Business, Educational. Recreational

★ FIRMWARE

ROM Chips, Memory Cards, 80column Cards, Communications Interface

★ HARDWARE

Disk Drives, Hard Disks, Printers, Modems, Monitors (B&W/ Color). Others

★ PUBLICATIONS

Data Base Manuals, Hobby-Projects, Systems, Languages, **Electronics Reference Manuals**

Send For Free Gift and Complete Details

Ace Computer Rentals

2104 Triplett Street, P.O. Box Owensboro, KY 42301 WATCH FOR 800 NUMBER COMING!

44



- Written in fast Z80 machine lenguege. Single key control of all editing functions for ease of use:
- of use.

 Dynamic display of word count, line count, and free

- Dynamic display of word count, line count, and tree
 memory count.
 Superscripts, subscripta, underlined, bolded, expanded and condensed type styles combine end
 intermix within a line
 Automatically justifies and word-wraps on the screen
 as you type
 Search, Replece, end Global Search end Replece
 Odd and even pege user-definable heeders, footers,
 and page number lines.
 User-defineble linespacing, sheet size, top, left, end
 bottom mergins.
- bottom mergins. Move blocks of text from disk, to disk, and within
- Move blocks of tent from the text
 Examine disk directory on any disk and kill flies while editing
 Full screen editing of EDTASM end BASIC text files
- Autometic renumbering for EDTASM and BASIC

- age by pege peusing capability for sheet fed
- printers
 Supports both parallel end seriel printers
 Printer control code eccess
 Supports proportionel space justifying on
 Centronics 737, 739, Line Printer IV, Deisy Wheel II,
 Diablo, Dume, Starwriter, Spinwriter, C. Itoh
 Prowriter, NEC PC-8023A-C, TEC 8500R
 Also supports apecial functions of Microlline, MX-80,
- Prowriter, NEC PC-90623-NO, IEED GROWN.
 Also supports apecial functions of Microline, MX-80, MX-100, and Graftrax Plua
 Any character or symbol your printer cen print is accessable with the Special Character feature
 Works with NEWDOS, NEWDOS80, TRSOS,
 LDOS, and DOSPLUS Single or Double Density

GUARANTEE

Many word processing systems claim theirs are the best, but few would dare to guarantee them. Not us! We are confident that **ZORLOF** is the most useful word processing system on the market for under \$200.00. If you don't agree, return it within 30 days for a full refund.

CALL (305) 259-9397



ANITEK SOFTWARE PRODUCTS | P.O. BOX 1136 | MELBOURNE, FL. 32935 | (305)259-9397

Files and foibles ____

After getting the names of the desired input and output files, lines 250-300 break up the input file into a series of temporary smaller files. Each of these has NL or fewer lines, all in sorted order. Subroutine 1000 first reads in NL or fewer lines. Then, subroutine 2000 sorts them (you could replace this with a call to a fast machine language sort if you like). Finally, subroutine 3000 writes the sorted lines to a temporary file.

Once the input file is completely broken up, it is necessary to recombine the sorted files into a single file with a merge operation. Lines 310-460 are the merge operation.

Subroutine 4000 chooses an output filename for each merge and selects which files to merge. If we have enough file buffers available to merge all of the output files, we just merge directly to the final output file.

Whenever there aren't enough buffers available, we have to go first to an intermediate file (TEMPX) or TEMPX1). Why two files? If we have to use an intermediate file, it will be merged in the next step. If there are still too many files, we need another intermediate file for the following step. Look at the figure for merges of four or more files to see what

Once the files are selected for the merge and the output filename is assigned, the files are opened and the first line is read from all the input files in lines 320-380. With a line entered from each file, we look to see which line is smallest (or has the smallest key field, or whatever) using subroutine 5000. When the smallest line is selected, subroutine 5000 also reads in a new line from the input file that the smallest line came from. That line is written to the output file in line 410. If there was no line (we're at the EOF on all input files), we check subroutine 6000 to see if we're all done.

This procedure would be like taking a set of cards, breaking it down into smaller stacks, sorting each stack and combining them by taking the smallest visible card from each stack and placing it on the final stack. It can run automatically (which is nice) but requires a large amount of disk space (for temporary files). If it's all you've got though, it's better than nothing.

This same idea could be used to take a group of input files, sort them and during the merge operation have the results written to a series of output files of a standard size, or with a standard grouping. Can you make it do that? Try it and see.

Program Listing for Files and foibles

95 REM CLEAR SOME STRING SPACE

AND DEFINE ALL VARIABLES

96 REM TO BE INTEGERS FOR PROCE SSING

100 CLEAR10000:DEFINTA-Z

1Ø5 REM THESE PARAMETERS CONTROL

THE SIZE OF THE SORT/MERGE

106 REM OPERATION: NL = MAX NUMB ER OF LINES IN MEMORY

107 REM NFL = MAXIMUM NU

Files and foibles

MBER OF FILE BU	JFFERS AVAILABLE
108 REM	NX = MAXIMUM NUM
BER OF TEMPORAR	
110 NL=10:NFL=4	
	LN\$() IS THE LINE BUFFER
ARRAY	THOU TO THE DIME BOLLEY
	FF\$() IS THE TEMPORARY F
ILENAME LIST	fry() 15 THE TEMPORARY F
	EGG() TO THE COME OF THE
	FC\$() IS THE SET OF FILE
S TO USE FOR ME	
120 DIM LNS(NL)	,ff\$(NX),fC\$(NFL)
125 REM	FT\$ IS THE TEMPORARY FIL
ENAME ROOT	
126 REM	FT IS THE NUMBER OF THE
CURRENT TEMPORA	RY FILE
13Ø FT\$="TEMP":	FT=Ø
135 REM	FNCTR\$ PRINTS X\$ CENTERE
D ON AN 80 CHAR	PACTER LINE
	FNHDR\$ PRINTS A 3 LINE S
CREEN HEADER	THE S LIMING B
	\$)=STRING\$((80-LEN(X\$))/2
," ")+X\$	2)—21KING\$((80—FEN(X\$))/2
I FO DEFENDENCE (SE	rd_cmptarad/og_H_H\
TOW DEFTINEDRY (X	\$)=STRING\$(8Ø,"-")+FNCIR\$
(X\$)+CHR\$(13)+S	TRING\$ (80, "-")
200 REM	SORT/MERGE DEMO: M
AIN PROGRAM	
	HDR\$("SORT/MERGE"):PRINT:
ODTATO	
PRINT	
215 REM	GET THE INPUT AND OUTPUT
	GET THE INPUT AND OUTPUT
215 REM FILENAMES 216 REM	THESE COULD BE THE SAME
215 REM FILENAMES 216 REM 220 LINEINPUT"I	THESE COULD BE THE SAME NPUT FILE ====> ":FIS
215 REM FILENAMES 216 REM 220 LINEINPUT"I	THESE COULD BE THE SAME NPUT FILE ====> ":FIS
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT:PRINT	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT:PRINT 245 REM	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 22Ø LINEINPUT"I 23Ø LINEINPUT"O 24Ø PRINT:PRINT 245 REM 25Ø OPEN"I",1,F	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT:PRINT 245 REM 250 OPEN"I",1,F	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT:PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUBL000	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT:PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT:PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM 290 IF FLG<>1 T 295 REM 300 CLOSE	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT:PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM 290 IF FLG<>1 T 295 REM 300 CLOSE	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT:PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM 290 IF FLG<>1 TO 295 REM 300 CLOSE 305 REM N	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I", 1, F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM 290 IF FLG<>1 T 295 REM 300 CLOSE 305 REM N 306 REM	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I",1,F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM 290 IF FLG<>1 T 295 REM 300 CLOSE 305 REM N 306 REM TPUT FILE ASSIG	THESE COULD BE THE SAME NPUT FILE
215 REM FILENAMES 216 REM 220 LINEINPUT"I 230 LINEINPUT"O 240 PRINT: PRINT 245 REM 250 OPEN"I", 1, F 255 REM T FILE 260 GOSUB1000 265 REM 270 GOSUB2000 275 REM OUTPUT FILE 280 GOSUB3000 285 REM INPUT FILE HAS 286 REM 290 IF FLG<>1 T 295 REM 300 CLOSE 305 REM N 306 REM TPUT FILE ASSIG 310 GOSUB4000	THESE COULD BE THE SAME NPUT FILE

UTPUT

TRS-80* Model III	Hardware & Software at discount
	prices.
UNALL III	NA 3

ACORN SOFTWARE Sug. List.	Our Price
ACORN SOFTWARE Sug. List. Astro Ball (T or D)	15.95
Everest Explorer (T or D)	15.95 15.95
Invaders From Space (T)	11.95
Lost Colony (T or D)19 95	15.95
Money Manager (D)39.95	31.95
Space Rocks (T or D)19 95	15.95
Superscript (D)50 00	40.00
ADVENTURE INTERNATIONAL	
Adventures 1 thru 12 (T) each	15.95
Escape From Traam (T)19_95	15.95
Maxi Manager (D)99 95	79.95
Star Fighter (T)	19.95
Star Trek 3.5 (T)	11.95
Stone of Sisyphus (D)	23.95
The Curse of Crowley Manor (T)	15.95
AUTOMATED SIMULATIONS	
Crush, Crumble & Chomp (T or D)29.95	23.95
Date Stones of Ryn (T or D)	15.95
Rescue At Rigel (T or D)	23.95
Star Warrior (T or D)	31.95
Tuesday Morning Quarterback (D)	23.95
BIG FIVE SOFTWARE	
Attack Force (T)	12.75
Galaxy Invasion (T)	12.75
Meteor Mission 2 (T)	12.75
Robot Attack (T)	12.75
Super Nova (T)	12.75
BRODERBUND SOFTWARE	
Galactic Empire (T)14 95	11.95
Galactic Revolution (T)14.95	11.95
Galactic Trader (T)14 95	11.95
Galactic Trilogy (D)	31.95
Tawala's Last Redoubt (T)	15.95
THE CORNSOFT GROUP	
Scarfman (C)15 95	12.75
DATASOFT	
Arcade - 80 (T)19.95	15.95
HAYOEN SOFTWARE	
Sargon II (D)	27.05
	27.95
MED SYSTEMS	
Asylum (T)	11.95
Asylum (D)	15.95
Deathmaze 5000 (T)	11.95
Labyrinth (T)	11.95
MICROSOFT	
Adventure (D)	23.95
Olympic Decathlon (T)24 95	19.95
RADIO SHACK	
26-2204 Compiler Basic (D)149.00	119.20
26-1552 General Ledger (D)99 95	79.95
26-1553 Inventory Control I (D)	79.95
26-2014 Model III Disk Course (D)	23.95
26-1596 Model III Visicalc (D)	155.00
26-1556 Payroll (D)	155.95
26-1592 Profile III Plus (D)	155.00
26-1590 Super Scripsit (D)	155.00
STRATEGIC SIMULATIONS	
Tigers In The Snow (T)24 95	19.95
SYNTONIC SOFTWARE	
Interlude (T)	15.15
(T) = Cassette Tape (D) = Disk	
(1) — Dassollo Taho (D) — Disk	

REPRESENTING OVER 20+ COMPANIES WITH 300+ PROGRAMS AND HARDWARE.

WRITE FOR FREE MODEL II, III OR COLOR COMPUTER CATALOGS TO:

Computer House P.O. Box 538, Mammoth Lakes, CA 93546 (714) 934-6538

Terms: FDR FAST OELIVERY, send certified checks, money orders or Visa or MasterCard number and expiration date. Personal checks require 3 weeks to clear. ADD \$1.50 for postage. Orders over \$100 we pay shipping. All foreign orders add \$10. CALIFDRNIA residents add 6% tax. Prices subject to change.

46

* TRS-80 is a trademark of Tandy Corp.

FREE

business software directory

- Radio Shack's Model I, II, III.
- Heath's MBASIC and HDOS
- CPM: Xerox, Alto...
- IBM Personal Computer
- "IDM2 is GREAT!"

- publisher of 80-US

"(GL) superior to either the Osborne (SBSG & Taranto) or Radio Shack... MAIL-X has a greater capacity... more flexible than (R.S.)"

-columnist of 80-microcomputing

"imperceptively fast...(DBMS) is a good and reliable workhorse" - publisher of Interface Age

Data base manager, integrated accounting package (AR, AP, GL & Payroll), inventory, word processing, and mailing list. Compare and be selective!



Micro Architect, Inc. 96 Dothan St., Arlington, MA 02174

A Pot Of Gold For YOUR Color Computer

"I buy practically avary computar magazina there is, but **the RAINBOW** is the only one I read cover-to-cover as soon as it comes in the mail." – A subscriber

The RAINBOW gets that sort of response for more reasons than one but the primary one is simply it is the premier magazine for TRS-80* Cobr Computer users. And, because it devotes every page of each monthly issue exclusively to the Color Computer, it is the single best source of information for everything users to know the color computer.

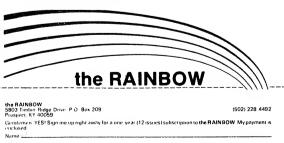
is tha premier magazine for TRS-90° Color Computer users And. because it devotes every page or earn monthly issue exclusively to the Color Computer. It is the single best source of information for everything you want to know.

Tired of trying to convert other computer programs to your Color Computer? No wornes Each program in the RAINBOW is written exclusively for your computer— and many take advantage of all the excellent graphics commanda unavailable on other machines? The nation is leading software authors have contributions evary month.

Average of the color Computer It you are looking for weys to do screen prints, alphabetize disk directories, save machine language programs or print videolex input on your printar the RAINBOW has programs for you And. If you want to know when some promised software will really be aveilable for purchase, you'll get thet answered, too.

Our futionshave been prised for the clear concise way they explain—in detail—vanous functions of the Color Computer a And the RAINBOW's reviews are an excellent end honest buyer's guide to software and other purchases.

Whather your Color Computer is 4K 16K or 32K. Whether you have Color Basicor Extended Whether you rai not assembly language (or want to get into it) or not Printers Disks Rom packs The RAINBOW surveys the whole world of the Color Computer each month and provides what one reader called. A pot of gold full of Idabous information available and the purchase is a proper to the color Computer when the RAINBOW gives fast tumarduration do meet its monthly deadings. So, you can expect these news when it is news and the latest information available and the proper promise. If after you see your first issue you don't agree that the RAINBOW is the premier monthly magazine for Color Computer set with the RAINBOW is the premier monthly magazine for Color Computer set work.



Payment Enclosed Cherge my VISA # 11 Charga my MasterCerd # Signeture
Letterspread to the RAINBOW in 516 person of the U.S. Card Exp. Dete. Interbenk #
Letterspread to the RAINBOW in 516 person of the U.S. Card Library and person to the control to the U.S. Card Library and the control to the U.S. Card Library and the control to the U.S. Card Library and the Card Library and the control to the U.S. Card Library and the Card Library and C



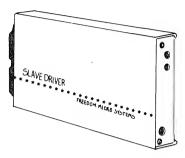
Files and foibles

316 REM	2-NZ FO
RINPUT	
320 OPEN"O",1,FC	\$(1)
330 PRINTFNCTRS ("OUTPUT FILE: "+FC\$(1))
340 FOR I=2 TO N	IZ
35Ø OPEN"I".I	.FCS(I)
360 PRINTENCI	PS("TNPIT FILE: "+FCS(T))
365 REM	:,FC\$(I) 'R\$("INPUT FILE: "+FC\$(I)) GET THE FIRST LINE FROM
EACH FILE	
370 LINEINPUI	THI INS(I)
380 NEXTI	- T / 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
385 REM	CHOOSE THE SMALLEST LINE
390 GOSUB5000	CHOOSE THE SPEEDEST SING
	IF THERE IS NO SMALLEST
LINE THEN WE'RE	TE THERE TO BE OFFICERST
	PASS THROUGH THE FILES
ANN THE TATE - IIII INT.	THIS INKOUGH THE FILES
TOO IT TING— IL	EN 430 PUT THE SMALLEST LINE TO
THE OUTPUT FILE	PUT THE SMALLEST LINE TO
410 PRINT#1,1	N\$:K=K+1:PRINTUSING"####
>";K;:PRINTLN\$	
42Ø GOTO39Ø	
430 CLOSE	CHECK TO SEE IF WE'RE AL
435 REM	CHECK TO SEE IF WE'RE AL
L DONE	
44Ø GOSUB6ØØØ	IF WE'RE NOT DONE, THEN
	IF WE'RE NOT DONE, THEN
30 GET THE REST	. 01.7
450 IF EF=1 THEN	1 310
460 END	
999 END	
1000 REM	READ FROM INPUT
FILE	
1005 REM	FLG IS A FLAG TO
	THE INPUT FILE
1010 FLG=0	
1020 PRINTFNCTRS	G("READING FROM: "+FI\$)
	READ IN UP TO NL
LINES	
1030 FORI=1TONL	
1040 IF EOF()) THEN FLG=1:GOTO1070 ENPUT#1,LN\$(I):PRINTUSING
1050 LINE	INPUT#1,LN\$(I):PRINTUSING
"####>";I;:PRIN	TLN\$(I)
1060 NEXTI	
1065 REM	NM IS THE NUMBER
OF LINES ACTUAL	LY READ IN
1070 NM=I-1:RETU	
2000 REM	SORT DATA IN ME
MORY	
2005 REM	SHELL SORT
2006 REM	SET THE INITIAL
GAP	
2010 GAP=NM	
2015 REM	IF THE GAP GETS
DOWN TO 1 THEN W	VE'RE DONE
2020 IF GAP<=1 7	
2025 REM	

PREVIOUS GAP	
2030 GAP=INT(GAP/2)	
2035 REM	SET THE SWAP FLA
G TO NO SWAPS	
2040 FG=0	
2050 FORI=1TONM-GAP	
2060 IF LN\$(I)>LA	S(I+GAP) THEN GOS
UB2100:FG=1	
2070 NEXTI	
2080 IF FG=1 THEN 20	
2100 REM SW	AP LINES
2105 REM	MOD I/III OWNERS
REPLACE THIS WITH A SW	
2106 REM	PROCEDURE SUCH A
S:	mark = ind (=) = = = 4 (=)
2107 REM	T\$=LN\$(I):LN\$(I)
=LN\$(I+GAP):LN\$(I+GAP)=	
2110 SWAP LN\$(I), LN\$(I+	
3000 REM EMPORARY OUTPUT FILE -	
	FI IS THE CURREN
T TEMPORARY FILE NUMBER	FT IS THE CURREN
3006 REM	MAKE NF\$, THE CU
RRENT TEMPORARY FILE NA	
3007 REM	IF WE'VE USED NX
FILES, THEN CUT OFF TH	
3010 FT=FT+1:NF\$=FT\$+MI	
\$(FT)=NF\$:IF FT>=NX THE	$N \in G=1$
3015 REM	WRITE THE LINES
TO THE TEMPORARY FILE	***************************************
3020 OPEN"O",2,NF\$	
3030 PRINTFNCTR\$("TEMPO	RARY FILE: "+NF\$)
3040 FORI=1TONM:PRINT#2	,LN\$(I):PRINTUSIN
G"####>"; I;:PRINTLN\$(I)	:NEXTI
3050 CLOSE2	•
3060 RETURN	
	- PICK OUTPUT FIL
E & INPUT OFFSET	
4005 REM	Fl IS THE FIRST
FILE TO READ	
4006 REM	F2 IS THE LAST F
ILE TO READ	
4007 REM	FF IS THE NUMBER
OF THE INTERMEDIATE ME. 4008 REM	
ITE THIS AS FF=FF-INT(F	MOD I/III CAN WR
4010 F1=F2+1:F2=F2+NFL-	
	MAKE THE INTERME
DIATE MERGE FILE NAME	NAME THE THIERME
4020 FF\$=FT\$+"X"+MID\$(S	ਾਲਵੇ(ਜ਼ਜ਼) 2)
4Ø25 REM	TWO CASES:
4026 REM	FC\$(1)="
" => FIRST TIME THROUGH	τ
4Ø27 REM	FC\$(2)<>
"" => ALREADY BEEN THRO	UGH
4030 IF FC\$(1)="" THEN 4	4Ø6Ø

NO BREAKS

SLAVE DRIVER® KEEPS YOUR PRINTER WORKING WHILE YOU AND YOUR COMPUTER DO MORE IMPORTANT IOBS...



Computers are fast...printers are slow. That's a problem more people are realizing every day as they wait for the slow printer to finish before they can use the fast computer again. Technology has come to the rescue by designing an electronic device that takes the output of the fast computer fast and feeds it to the slow printer slowly, as the printer needs it. It's called a printer buffer.

SLAVE DRIVER® is an inexpensive, universal printer buffer. It can be used with all popular micro-computers that have a centronics parallel port to the printer.

SLAVE DRIVER® receives information from the computer at up to 4000 characters per second and holds it until your printer can handle it. Your SLAVE DRIVER® is controlled by a custom LSI and uses standard centronics signals.

60 SECOND INSTALLATION

SLAVE DRIVER® is designed to be plugged directly into the input port of the Epson and other similar printers. It is powered by the printer or an AC adapter. Other centronics compatible printers can be attached. Installation can be completed in less than 60 seconds. Just plug it in.

SLAVE DRIVER® takes up little space; about the size of a paper back book. Such a little fellow for such a big job!

EASY USE AND FLEXIBILITY

SLAVE DRIVER® is completely transparent to the user, no machine language programming to learn, no control codes to send, no programs to change. The buffer-full light and the reset switch give full flexibility of operation. List your program to SLAVE DRIVER®, return to programming while the listing prints. Dump a line of data to SLAVE DRIVER® and compute the next record while the data prints. Send complete reports to SLAVE DRIVER®, make disc back-ups, even turn off the computer and go home. SLAVE DRIVER® oversees the printer until all the work is done.

JUDGE FOR YOURSELF

Each SLAVE DRIVER® comes complete with interface cable, power supply, instruction manual, 30-day money-back guarantee and limited one year warranty. To order send your check or money order to the address below: \$189.95 for the expandable 8K model (holds approximately a 4-page letter); \$289.95 for the 64K model (holds a 32-page doublespaced report). Please include \$3.50 for shipping. Visa and MasterCard users may phone 703/228-5800 to hasten your order. (VA residents please add 4% sales tax)

IN STOCK AND AVAILABLE NOW

FREEDOM MICRO-SYSTEMS

Wytheville, VA 24382 Star Route★ 703/228-5800



49 Ď00000000000000000000000000

VISA

4116 REM K IS NUMBERING F WE HAVE TO MERGE 4Ø35 REM THE LAST INTERMEDIATE FILE & OR THE PRINTOUT 1 LESS TEMPORARY 4120 NZ=J:K=0 4036 REM 413Ø RETURN FILE FC\$(2)=FC\$(1):F2=F2-1:J=2 5000 REM - -- - SELECT SMALLEST 4040 GOTO4Ø7Ø INPUT LINE - - - - -4050 5010 FOR I=2 TO NZ:IF LN\$(I)<>"" THEN 50 4060 J=1 50 4065 REM CHECK FOR LAST F 5020 NEXTI ILE 5Ø3Ø LN\$="" 4070 IF F2>FT THEN F2=FT 5Ø4Ø RETURN IF THIS IS THE L 4Ø75 REM 5050 FC=I:LN\$=LN\$(I):J=I+1 AST PASS, THEN WRITE TO 4076 REM THE DESIRED OUTP 5060 IF J>=NZ THEN 5100 5070 FORI=JTONZ: IF LN\$(I)="" THEN 5090 UT FILE, OTHERWISE WE'LL USE AN IF LN\$>LN\$(I) THEN LN\$=LN\$(I):FC 5080 4077 REM INTERMEDIATE =T4080 IF F2=FT THEN FC\$(1)=F0\$ ELSE FC\$(1)=FF\$ 5Ø9Ø NEXTI 5100 IF NOT EOF(FC) THEN LINEINPUT#FC, LN 4085 REM GET THE TEMPORAR \$(FC) ELSE LN\$(FC)="" Y FILENAMES 511Ø RETURN 4Ø9Ø FORI=F1TOF2:J=J+1 6000 REM - - - -FC\$(J)=FF\$(I)- - - CHECK FOR END O 4100 F PROCESSING - - - - -411Ø NEXTI NZ IS THE NUMBER 6010 IF FC\$(1)<>FO\$ THEN EF=1 ELSE EF=0 4115 REM 6Ø2Ø RETURN ■ OF FILES THIS GO AROUND

New Software Tools for Your TRS-80 Make Your Micro Even More Useful!

>>**REBACKUP**<< Don't lose your important programs Remove backup protection from Scripsit, VisiCalc. and others Model III, 1 drive, 32K and up

>>**PAGER**<< Document your programs better Produces paged, formatted program listings, with byte and line count Model I/III, 1 drive, 32K and up

>>MATRICES<< Add important capability Provides matrix manipulation utilities Model I/III, BASIC. 16K and up

>>UNLIST<<< Protect your program secrets Makes all or selected lines hard to list Model I/III, 1 drive. 32K and up

>>PHONEWRD<< Use easily remembered phone words
Print all letter combinations for phone numbers Model
1/III, BASIC, 16K and up

>>PACK<< Make your programs smaller and faster Selective removal of some or all remarks, spaces, or both Model I/III, 1 drive, 32K and up

>>HIDE<< Frustrate software pirates Inserts misleading errors in BASIC program listings to hide secrets Program runs as usual Model I/III, 1 drive, 32K and up

>>COMPARE<< Update programs faster. easier Compares 2 BASIC program versions to show changes and differences Model I/III. 1 drive. 32K and up

>>PRIMEINT<< Improve your financial analysis Shows prime interest time series for over 30 years of monthly data Tables and graphs Updating data available Add your own subroutines Model I/III, 1 drive. 48K

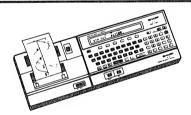
>>Time series programs also available for S&P 500, Japan, West Germany, France, United Kingdom, Italy, and Canada <<

Cost per program is \$24.95 postpaid Software provided on cassette, with operating manual Written in BASIC for easy expansion Instructions built into program Guaranteed to load and run Can be provided on DOS disk you supply

ORDER FROM

DATA ASSOCIATES Box 882-T, Framingham, Mass. 01701

TRS-80 and Scripsit are trademarks of Tandy Corp VisiCalc is a trademark of VisiCorp



SHARP'S NEW PC1500 / CE-150

A POCKET Computer with PERSONAL Computer Capabilities. CE-150 Printer/Cass. Interface Add 4 color printing and plotting and controls to cassette deck for program and data storage.

data storage.	List	Costs
PC1500	\$300.00	\$234.95
CE-150	\$250.00	\$214.95
(Printer/Lass. Int.)		
4 K Ram Module	\$ 75.00	\$ 59.95
8 K Ram Module	\$150.00	\$119.95
Pens (4 - all black or 4 colors)	\$ 3.95	\$ 3.45
Paper (1 case)	\$ 39.95	\$ 37.95

Minimal order for free shipping is \$50.00 # 51 Missour

UPERIOR OFTWARE INC P. D. BOX 11676-KANSAS CITY MD 6413B Missouri Residents Add 4 1/2% Sales



P. O. Box 11676, Kansas City, MO 64138

The Lawyer's Microcomputer"

A Newsletter for Lawyers Using the TRS-80*

Seminar
St. Thomas,
U.S., Virgin Islands
January 3 - 10, 1983
For Lawyers using
Radio Shack
Computers
for details
Call Toll-Free:
800-821-6129

A New Monthly Newsletter For Lawyers

Send \$28 For A
One Year Subscription

The Lawyer's Microcomputer™
P.O. Box 1046B
Lexington, SC 29072

*TM Tandy Corp

52

MULTIDOS

- IS THE DOS WITH THE MOST EFFICIENT DISK BASIC INTERPRETER.
- IS THE DOS WITH THE ORIGINAL AND STILL THE BEST SINGLE STEP BASIC.
- IS THE MOST COMPATIBLE OPERATING SYSTEM ON THE MARKET.
- IS EASY TO LEARN EASY TO USE!

MULTIDOS does the following AUTOMATICALLY!

ADJUSTS for CPU speeds of 1.77 thru 5.32 MHz without the need for slowdown during disk I/O.

DISABLES when CLOAD, CSAVE, or SYSTEM is entered from the command mode **INTERRUPTS** (Model I).

EXECUTES the most commonly used Library command, DIR, with one keystroke.

PREVENTS system hanging, even without a diskette in drive ZERO.

READS single density, double density, Model I and Model III diskettes.

STEPS machine language programs for debugging (controlled execute).

TOTALS free diskette space on all mounted diskettes.

VISA & MasterCard

WELCOMED

Foreign Orders Add \$10.00

For Model I Orders Only *

Please specify Single, Double

For Shipping & Handling

or P Density.

SENSES type of double density hardware (RS or others).



— MAIL ORDERS —

Cosmopolitan Electronics Corporation

P.O. BOX 89 • PLYMOUTH, MICHIGAN 48170

- TECHNICAL INFORMATION -

Cosmopolitan Electronics Corporation

C/O VERNON HESTER 42403 Old Bridge Road • Canton, MI 48188 • (313) 397-3126

53

\$9995

\$3.00 For Shipping & Handling

Michigan Residents Add 4% Sales Tax

C.O.D. Orders Add \$1.50

Personal Checks Take 2 Weeks To Clear

@ News

Wafer management

For ESF owners

Spencer Hall, Associate editor

There's a stereotype, in American folklore of the astute small town businessman who operates from a roll-top desk piled high with papers. Within seconds, he can lay his hands on any document he needs. I don't believe it! Do you? At any rate, serious users of the Stringy Floppy know that this approach to wafer storage is disastrous.

This month, we'll talk a bit about identifying wafers, recording their contents, storing and retrieving them—in short, wafer management. We'll address our remarks to Joe Rolltop, who has one hundred fifty wafers, give or take a few, stashed in envelopes, unmarked wafer organizers, wafer boxes, and one empty coffee can. Some of them (not all) have their contents scrawled on the labels.

First, Joe, you need "What's On It" (Exatron program 142, \$9.95). Boot it up, and you can see exactly what any wafer contains. File numbers are shown. BASIC programs, machine language programs, and data files are each identified by type. The length is given and the first few characters of each are displayed. It's a good idea to rewrite all BASIC programs to put the name in a REMark on the first line so this program will display it. Using "What's On It" is, of course, no substitute for good organization, but it does help bring order out of chaos.

As Joe "reads" his wafers with this program, he should mark them temporarily, pending a permanent label. Sanford's "Vis-a-vis" marking pen makes beautiful black lines on glass, cellophane, etc. Use it for temporary I.D. on the old-style plastic labels. Newer labels are paper and can't take temporary marking. Get some plastic laminating sheets, such as Dennison's PRES-a-ply Clear Seal. Cut pieces in wafer label size, attach them, and voila, your paper label has turned to plastic. "Scratch" wafers, whose contents change frequently, need this type of identification.

Joe can make permanent labels, if he has a line printer, by using the X-Label program (80-U.S. Journal, July, 1982), or Bill Burnham's Super Label Maker (Exatron 182, \$9.95). If you don't have a printer, get a box of Avery 3/4" by 1" labels (stock S-1216) and a fine point pen such as Sanford's Expresso. (No, I don't own stock in Sanford!)

Now that you have all of your wafers labeled, Joe, where are you going to keep them? That coffee can has got to go! The answer depends on the nature of each program. It helps to classify programs (and wafers) as follows:

Masters— the copies you paid good money for and never touch unless there's a disaster. These need your safest, but not necessarily handiest, storage device.

Major backups— which are treated exactly the same as masters.

Often used— which may include utilities, if you're into programming; favorite games, if they're your bag; and certainly, those applications you can't do without, such as budget analyzers, check registers, data managers, etc.

Other programs— miscellaneous games, programs copied from magazines, code fragments you've written— all of the things you don't use every day but want to keep.

Data files— generated by a text editor, database manager, or special application package, such as an accounting system.

"Masters" and "major backups" are relatively small groups, while "data files" may become large over a period of time. For both of these, Joe can get himself a box of Oxford Pendaflex file guides (stock PN225). These are heavy cardboard panels with tabs from A to Z. He also needs a supply of single-pocket vinyl business card holders, available from several manufacturers.

Staple these, eight to a panel, in two rows of four, on the dividers. You can keep these panels in a letter-size file cabinet, or in a portable file box. If you keep them in Pendaflex hanging files, you can include a log of wafer contents for each panel. Keep the log on a heavy grade of ledger paper to stand repeated handling. Paste your own identification labels over the letter tabs, or use the letters as prefixes in a wafer numbering system.

If Joe has a radial arm saw (or knows someone who does) he could make himself a tray for "often used" wafers. Use a scrap of 2" by 10" lumber, cut across the grain to a width of $2^{3}/_{4}$ ", which is slightly larger than the width of a wafer. With a dado head set for a one-quarter inch slot, make uniformly spaced cuts (about one-quarter inch apart) across this piece, at an angle of about sixty degrees from horizon-

84 80-U.S. Journal

tal. Cut to a depth of one-half inch from the opposite side. Cutting with the grain avoids the problem of cross-grain in the ridges between slots, which causes them to crumble as they are cut. Close the sides by nailing on side panels. I used scrap pieces of $1\frac{1}{2}$ " decorative trim which were just right, if a bit ornate.

Joe could also order the Wafer Wheel from Exatron, which we mentioned in July. Either device sits handily at the left of your keyboard with its contents instantly available.

For what will ultimately be the largest part of any wafer collection, the category I called "other programs", ring binders are the most elegant. They don't have to be expensive. They won't get heavy use. Three-hole punch 8½" x 11" card stock, or hack up file folders. Tape vinyl business card pockets to these pages, two rows of three each, with the panel in the normal (vertical) position. An index on ledger paper can be placed in each

volume.

Of course, there are endless other ways to store wafers, many of them better, I'm sure, than those I've described. An element of personal preference goes into the choice. If you have a unique storage system, let's hear about it. The rest of us will be interested.

"No Win" Department

A few months ago, I wrote about the EOT/BOT beeper which could be installed in your Stringy. I mistakenly said Exatron would retrofit it. The following month, I apologized for the error and described how even a beginner could install it. There was a major error in my instruction! With this track record. I'm afraid to even attempt a correction, but here it is, in case anyone still cares! The condenser is actually near IC 6 (it's identified on page F-2 of the manual as C21). It is mounted above, or sometimes below. the board. The trace, at the end of which the red beeper lead is to be soldered, actually extends out from under IC 5, and not IC 11. I've answered several inquiries already and still have more to go.

Scripsit Note

Several people have written about Scripsit for ESF. Here are some summary notes. You can put your tape version on wafer by using the ESF Monitor (Exatron 192, \$9.95 — most valuable of all ESF software). This needs a twenty-foot wafer because it's just a wee bit too long for ten feet. This version loads rapidly, but saves and loads text only via tape. Get the ESF patch from Exatron (133, \$9.95), load your tape version, then load the patch.

The patch overlays the tape version, converting it to accept commands to save by file number, load by file number, certify (@NEW) by file number and even choose the drive. Standard ESF responses, e.g., error messages, bytes certified, etc., appear in the special command line as needed. Saves are continuous and

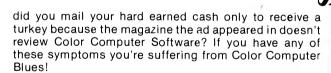
Subscribe to GGN

Are you tired of searching the latest magazine for articles about your new Color Computer? When was the

last time you saw a great sounding program listing only

to discover that it's for the Model I and it's too complex

to translate? Do you feel that you are all alone in a sea of



Color Compute

Z-80's? On finding on ad for a Color Computer program But take heart there is a cure! It's COLOR COMPUTER NEWS.

The monthly magazine for Color Computer owners and only Color Computer owners. CCN contains the full range of essential elements for relief of CC Blues. Ingredients include: comments to the ROMS, games, program listings, product reviews, and general interest articles on such goodies as games, personal finances, a Kid's page and other subjects.

The price for 12 monthly treatments is only \$21.00 and is available from:

54

C 3	• 1116
	Mail .
	Today

REMarkable Software

P.O. Box 1192 Muskegon, MI 49443

NAME			
ADDRESS			
CITY		State	Zip
	Allow 8-10 weeks for 1st issue.		. 80.110

are verified. The patched (revised) version can be backed up ad infinitum and you never need the tape version, or the patch you bought (darn it) again.

There's also a program called Crossword, which converts Scripsit tape files to ESF files. At this writing, I don't know what it costs, or anything else about it. If you're interested, call the hot line.

Mr. Paul Secord of Houston, Texas, reports several interesting things about Scripsit, to wit:

"If you're like me, you have entered substantial text into memory and then, instead of entering S F1 for save, you (inadvertently) enter L F1 for load. Your text disappears from the screen and the Scripsit buffer appears empty. But, it isn't! Use any monitor available to print the text, which begins at (RAM) address 6ED1H. In that way, at least you don't have to recompose your deathless prose.

"Or, once again, you have substantial text entered, but you forgot

to set your printer to the kind of type-face that you want. If you reset, give your printer the appropriate BASIC command, and return to Scripsit via 4300H, you will wipe out your text. But there is another reentry which will save your text and let you continue from where you left off. After reset, and after giving your printer the appropriate commands, do the following: 1) Type SYSTEM, 2) press ENTER, 3) type /21510, 4) press ENTER, 5) press CLEAR, and you will be back in Scripsit, with text preserved.

"Finally . . . I become impatient with the slow cursor movement during . . . editing. You can set the speed of the cursor . . . with a simple POKE command. The byte at 20785 controls cursor speed, both vertically and horizontally. The default value is decimal 13. This can be done by resetting to BASIC after loading Scripsit and POKEing (a smaller number into address 20785). Then, do SYSTEM and /21490 to return to initialized Scripsit. I prefer an

accelerated speed achieved by the command POKE 20875,4. Apparently, this value, with some kinds of touch, may cause key repeats, so if 20875,4 is too fast, try some value between four and thirteen. It will really speed up your editing!"

Your @NEWS editor has a big problem with all of this. When I reset out of Scripsit, my operating system is a mess, and I can't do anything, let alone what Mr. Secord suggests. I can change cursor speed by holding shift when I load Scripsit from wafer, thus defeating the autostart. Now, I execute the POKE 20875,6 and do a SYSTEM /17152 to get into Scripsit. As for the rest, it sounds great, so I've printed it here. If anyone knows how to take advantage of it, please write to me at 80-U.S. Journal!

Christmas In November

In case your January issue doesn't arrive before the holidays, have a very Merry Christmas and, in all ways, a Happy 1983. ■



T & D SOFTWARE P.O. BOX 256-C . HOLLAND, MICH 49423

PRIZE WINNING CHESS

— The Finest Available — See 80 U.S. Journal, June '82

SFINKS 3.0 Prize winner in Paris, plays ruthless chess! Problem set-up, infinite levels of play, 32 book openings, audio alert, printer output, thinks even while you're thinking!

32K Tape or Disk Only \$39.95

SFINKS CHESS TUTOR Step-by-step programmed learning for the newcomer, includes 3-level chess game, problem set-up, printer output, audio alert, and book openings.

32K Disk Only Only \$19.95

SFINKS 1.81 Plays prize-winning chess, pre-chess and transcendental chess, nine levels, problem set-up, audio alert, move suggestion and takeback.

32K Tape or Disk Only \$24.95

Please specify tape or disk and Model I or III. Include \$2.00 shipping and handling.

William Fink (904) 377-4847 1105 North Main, Suite 24-B Gainesville, FL 32601



Data Ace

A powerful database manager for the Model II

Model II

T. R. Dettmann, Associate editor

Anyone working with business software is associated with database management. After all, what is a general ledger, if not a database? The same goes for inventory, accounts receivable, accounts payable and so forth.

Data Ace is a standalone database management system which provides the user with a simple, flexible, yet incredibly powerful, relational database management system. Using simple commands such as LIST, ADD, CHANGE and DELETE, you can do a major part of the normal data management tasks necessary in most systems.

If you wanted to list an account number 156, you would simply say: LIST ACCOUNT 156, if you had previously defined the account relation. In order to list all accounts in the account relation, you make the request plural: LIST ACCOUNTS. The whole system is this easy to use.

If that were all the system provided, it just wouldn't be enough. You should also be able to search through the database and look at records selected according to specified criteria. What if you wanted a list of all accounts that have balances over \$1000 and are greater than ninety days overdue? Could your accounts receivable provide such a list? Probably not.

Data Ace makes questions like that easy to answer, even if you didn't think of them when you started. What's even better is that you can automate such requests as new commands in the system.

Flexible report processing is a much harder requirement to meet. If you buy an accounting program off the shelf, you're stuck with its reporting formats unless you change them yourself. With Data Ace, it's so simple to define a new report format, you just define special reports as needed.

Let's assume you have a customer file which records all orders for each customer. As a salesman, you might want to make a report which lists all customers who have large amounts of credit available and a history of buying but who haven't bought recently. The Data Ace manual shows you how to make such a report.

Do you want totals? Data Ace can handle them. Special heading on your reports? Data Ace has that too! I was most impressed with its ability to combine relations.

Let's say that we define an inventory relation (think of it as an inventory file if you wish). If we want to scan an order-entry relation for information and at the same time pull out amplifying information from the inventory, Data Ace can do that with the JOIN command. During a join operation, two normally distinct relations are treated as one. Try that with Profile or Profile Plus!

So even with all that, you still

want to make more of it. Well, that is possible too. Data Ace has a built-in fully-structured programming language modeled on Forth. Using volume two of their manual, you get a beginner's introduction that gives you enough practice in their Data Manipulation Language (DML) to be able to add your own customizing to the system.

DML is a derivative of polyForth and was developed by Computer Software Design, Inc. to provide the programming ability they needed. It comes as part of the Data Ace system. You don't have to know, or love, Forth to like DML (but it does help). Learning DML makes it possible for you to tailor a system the way you want it.

The system comes with three disks. The first disk is the Data Ace system disk. This is not a TRSDOS system. In fact, it is a complete system all by itself. The Data Ace system disk goes in Drive 0 when you boot-up and it starts up in the Data Ace system, ready for use. No Disk Operating System to worry about, just Data Ace.

The second disk is a demonstration data disk. The whole manual for Data Ace is keyed to playing games with the demonstration disk. Relations have been defined, data entered, and enough special work has been done so that you can play with all of the capabilities of Data Ace just on the demo disk.

December, 1982 87

The manual takes you through a series of examples and tells you what to try and what you should get. This makes the manual easy to follow. Less advanced users can stop with the simple data manipulation and definition facilities. More advanced programmers can learn to do anything they want.

It sounds like this package is too good to be true. Well, it almost is. It is remarkably flexible. It is amazing that it's here on so small a computer as the Model II. I have seen data management systems with this much power on large computers, but never on anything as small as a Model II. It gives you large machine power on a small machine.

I have had about two months to play with the system and try my hand at building databases and tearing them down. I have had numerous successes, primarily due to the ease with which I could follow the manual. By playing with their data disk, trying their examples, and working through their problems, I was able to get to the

point where I could create useful databases in only a few hours. I can safely say that I wouldn't hesitate to use this for a complete accounting system wherever it fit the task.

Backup

There is a normal backup procedure clearly explained in the manual for the data disks. But there is no way to do it for the master disk. That seems a little excessive to me. One problem and sorry, no system! It is especially bad if you have a great deal of custom programming on that disk. What do you do? The Data Ace people will replace your system, but they can't replace your customizing.

Data Ace also suffers from its own isolation. Since it is a standalone system, it can't read TRSDOS disks without special programming. You couldn't use it to share information with existing systems. Not unless you wanted to write your own disk access routines.

By isolating itself so much, Data Ace must function for now as a standalone system. That's not bad, it's not good, it's just the way it is. For many applications, that's just what's called for; for others, it isn't enough.

At \$850 for the Model II version, Data Ace is not the kind of thing you just pick up for fun. That kind of price is only justified by serious use. You have just got to generate some income from such a purchase.

Its advantages make Data Ace a major package to consider for the development of new software. The disadvantages of Data Ace are outweighed by the advantages. I certainly recommend Data Ace to anyone looking for the most powerful database management ability possible.

Ed. note: Data Ace is available from Computer Software Design, Inc., 1911 Wright Circle, Anaheim, CA 92806, (714) 634-9012. The company reports that a Model III, hard disk version will be available in the near future for \$375.

JFD-III Floppy Disc Controller Kit Now \$34900 }

Thousands of our controllers have been installed and the user satisfaction has been tremendous. Those who have compared the rest say that ours is the best.

Kit includes controller board, mounting brackets, cables, power supply for 2 internal drives, and illustrated instructions. This controller has been tested for compatibility with most major operating systems including TRSDOS, LDOS, NEWDOS/80, DOSPLUS, and MULTIDOS. The controller supports any mix of 5¼" drives including single or double density, single or double sided, 35, 44, 77 or 80 track drives.

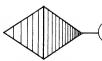
JHD-III Winchesters for TRS 80 Model III

5 Mbyte formatted — \$1,895 10 Mbyte formatted — \$2,195

These drives plug into the 50 pin I/O expansion port. System includes host adaptor, cables, fan cooled cabinet. Controller features 11 bit error detection and correction, automatic track remapping and variable sector interleaving. LDOS driver included with system. LDOS Operating System \$89.00.

TERMS: Cashier's Check or COD. Personal Checks take 3-4 weeks to clear.

To order call (505) 265-5072 or send order to:



J&M Systems, Ltd.

137 Utah N.E., Albuquerque, NM 87108

TRADEMARK CREDITS:

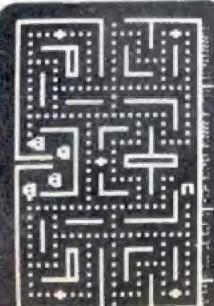
TRSDOS is a Trademark of Tandy Corporation LDOS is a Trademark of Logical Systems, Inc.

NEWDOS is a Trademark of Apparat, Inc DOSPLUS is a Trademark of Micro-Systems Software, Inc. MULTIDOS is a Trademark of Cosmopolitan Electronics Corporation.

57

Dealer inquiries invited.

Call for the name of dealer nearest you.





ORED PATROL

ARFMAN

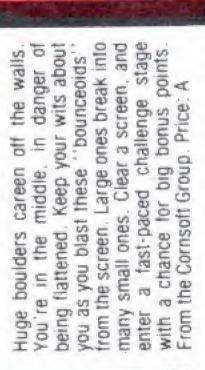
SC

REAR

ARM rhis incredibly popular game craze now runs on your TRS-80! It's eat or be eaten. You run Scrarfman around the maze, gobbling up everything in your path. Try to eat it all before nasty monsters devour you. Excellent high speed machine language action game from the Cornsoft Group. With sound.

Deadly waves of enemy Cyborg craft attack your fleet from the rear. You are the Mothership's sole defender. You have unlimited firepower but the Cyborgs are swift, nimble attackers. Your abilities are tested hard in this game or lightening fast action and lively sound from Adventure International Price: B A realistic tank battle simulation. Your view is a 3--D perspective of an alien landscape. Maneuver your T-36 tank to locate and destroy enemy tanks and robots that lay hidden. ready to assault you. Clever graphics create the illusion of movement and dimension. From Adventure International. With sound. Price: B

BOUNCEOIDS



AR ATERPILL U

An arcade favorite! Stop these multi-sectioned crawlers before they creep down through the mushrooms. Zap one and it splits into two smaller bugs. each with its own sense of direction. There are moths and tumble bugs too. It all adds up to lots of fun for kids and adults alike. From Soft Sector Market-ing. With sound. Price code: A

P 10

DEFENSE COMMAND

thieving aliens, repeatedly. An alien passes your guard, snatches a canister and flys straight off. Quick! You have one last chance to blast him from the sky! With sound and voice. A The invaders are back! Alone, you defend the all important nuclear fuel canisters from the repeated attacks of thieving aliens, repeatedly. An alien

-

.

AZY PAINTER CB

You have to paint the floor white. We give you the paint and brush. Sounds easy? Hah! You'll be confounded by stray dogs, snakes, sloshing buckets of furpentine, even a ravenous "paint eater." A crazy, imaginative new game with ten selectable levels of skill for new or seasoned game players. Lot's of laughs. Price: A

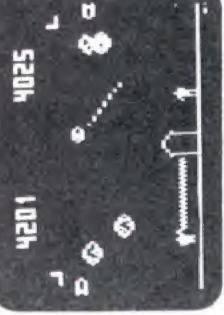
SUPER NOVA

0

Asteroids float ominously around the screen. You must destroy the asteroids before they destroy you! (Big asteroids break into little ones). Your ship will respond to thrust, rotate, hyperspace and fire. Watch out for that saucer with the laser! As reviewed in May 1981 Byte Magazine. saucer wed in M

METEOR MISSION II

As you look down on your view, astronauts cry out for rescue. You must maneuver through the asteroids and meleors. (Can you get back to the space station?) Fire lasers to destroy the asteroids, but watch out, there could be an alien Flagship lurking Includes sound effects! Price A



house 100 vandalize HILE YEAR

OUTHOUSE

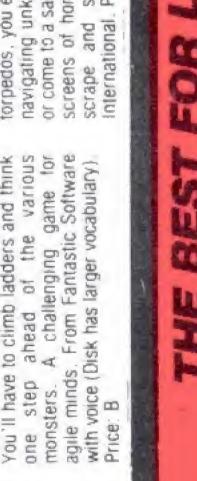
GALAXY INVASION

Your Smart lerror sniail (but important) wooden structure for reasons unknown a pizarre gang of miscreants wish to vandalize loot and otherwise destroy patrol craft has lasers and sr bombs to deal with this fer From SSM with sound Price are the mighty profector

The sound of the klaxon is calling you' invaders have been spotted warping toward Earth. You shift right and left as you fire your lasers. A few break formation and fly straight at you! You place your finger on the fire button knowing that this shot must connect! With sound effects! Price: A

GAME PRICES

A: TAPE: \$15.95 • DISK: \$19.95 B: TAPE: \$19.95 • DISK: \$24.95 C: TAPE: \$24.95 • DISK: \$24.95 TAPE: For Model I + III, 16K Level II DISK: For Model I + III, 32K, 1 Disk All games are joystick compatable or may be played using the arrow keys.



scrape and sound I

cabulary)

As you can see, all the best games from the top games are fun without the joystick but we hope that you are one of the many thousands who These enjoy the advantage of real joystick action. compatible. joystick are producers

Joystick you get the ex-quisite pleasure of enjoy-ing (action games) to the limit of arcade-style realism."

"If you purchase Alpha's

-80 Microcomputing 80 Reviews, Jan '82

Now you can deduct up to 20% on the price of games: buy any 2 games deduct 10%, buy any 3 games deduct 15%, buy any 4 games deduct 20% from game prices

1. SCARFMAN - All time favorite
2. ARMORED PATROL - Super 3D graphics
3. PENETRATOR - Rave reviews
4. STELLAR ESCORT - Fast and Challenging
5. CRAZY PAINTER - Unique game concept
6. PANIK - Remarkable Voices
7. DEFENSE COMMAND - Tough struggle
8. CATERPILLAR - Good rendition
9. ROBOT ATTACK - With voice
0. SEA DRAGON - Amazing "Seascape"

+ Features the lamous Atari Joystick
+ Works with all Model I or fill systems
+ Compatible with any other accessories
+ Saves your keyboard from abuse
+ Experiment in BASIC Use A = INP(0)
+ Complete ready to plug in and use
+ Model III. plugs into KB or E/I
+ Model III. plugs into 50 pin I/0 bus

Price includes Joystick + Alpha Interface

95

ONLY \$39.

Demo Program listing

14 DAY MONEY BACK GUARANTEE

C 1982

Please specify Model | or III

- えるよららてるのの



ꢀ ¥€ €≎ ∪€¢€≎

€€♦€◊ 6460

DEFENSE ASER

the U.S. strategic defense satellite system. From your viewpoint high above the globe, you intercept Soviet nuclear missiles in flight and attempt to destroy their scattered missile silos. With sound from MED Systems. In this game of ICBM's, high-energy lasers and particle beams, you control the U.S. strategic defense satellite system. From your viewpoint high

58



Your submarine, the U.S.S. Sea Dragon, penetrates a mined enemy channel. Armed with missiles and torpedos, you engage the enemy while navigating unknown waters. Succeed or come to a salty end in this game. 29 screens of horizontally scrolling seasorage and sound from Adventure.

game for c Software

weaponry is the latest rapid fire missiles. long range radar, and incendiary star shells. Your force tield can absorb only a limited number of impacts. A complex game of strategy, skill and reflexes from Melbourne House, Price: A

Trapped at an enemy building site, your fate seems certain. Your laser is empty and evil Mzors are closing in You'll have to climb ladders and think one step ahead of the various.

rapid fir

As the primary defender of a world cities under deadly allen attack, yo weaponry is the latest rapid fi

STRIKE FORCE

GUARD

A DRAGON

SE

PANIX

ESCORT STELLAR

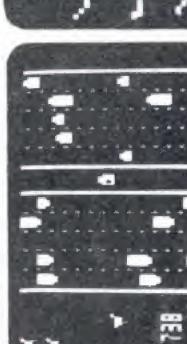
The latest super action game from Big Five. As the Federation's top space fighter you've been chosen to escort what is possibly the most important shipment in Federation history. The enemy will send many squadrons of their best fighters to intercept. With sound Disk version has voices.

ROBOT ATTACK

Talks without a voice synthesizer, through the cassette port. With just a hand laser in a remote space station, you encounter armed robots. Some march towards you, more wait around corners. Careful, the walls are electrified. Zap as many robots as you dare before escaping to a new section. More robots await you. Price A

LANDER LUNAR

-80 graphics we have ever Adventure International Price A As a vast panoramic moonscape scrolls by, select one of many landing sights. The more perilous the spot, the more points scored -- it you land You control LEM main engines you control LEM main engines ide thrusters. One of the best side thrusters. Price. safely You -With sound



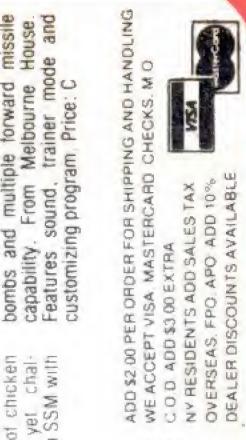
CHICKEN

Will the cricken cross the road? finat's up to you can you guide these helpless intie chicks across the perilous 10 iane super highway to satery? Or will you sumble, littering the blacktop with a storm of chicken teathers? A humburous yet challenging game of nerves from SSM with sound Price A



PENETRATOR

Soar swiftly over jagged landscape, swooping high and low to avoid obstacles and enemy missiles attacks. With miles of wild terrain and tunnels to penetrate, you're well armed with bombs and multiple forward missile capability. From Melbourne House. mode and reatures sound, trainer n customizing program, Price; capability. Features s





11421

Woodhaven, NY

Ave.,

Jamaica

79-04

0

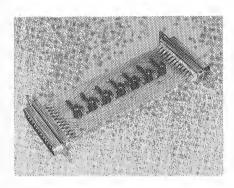
TRS-80 screens. All photos are actual

Orders Only, NY & Info call (212) 296-5916. Hours: 9-5 E.S.T.

der

à

New products



RS232 Tester

B & B Electronics offers an RS232 Tester which monitors and displays the status of the seven most important RS232 lines. LEDs clearly display the status of Transmit Data, Receive Data, Request To Send, Clear To Send, Data Set Ready, Carrier Detect and Data Terminal Ready. The unit has one male and one female 25-pin connector for easy (no adaptor required) insertion into any RS232 interface. The tester requires no power, and is designed to be left in the line permanently. It does not affect data-transfer ability.

Available directly from the manufacturer, B & B Electronics, Box 475, Mendota, IL 61342 or Phone: (815) 539-5827, at \$39.95 postpaid.

#200

New 3" Micro-Floppydisk Drive and Cartridge

Just introduced by Amdek Corporation, the Micro-Floppydisk offers one-megabyte capacity and is plug compatible with standard five-inch floppydisk drives. The new drive has a built-in power supply and accommodates two three-inch Micro-Floppydisk cartridges.

Only .179" x 3.15" x 3.94," the new Micro-Floppydisk cartridge features a flip-type, hinged head cover that protects the three-inch disk from dust, scratches or fingerprints.

Single-side recording capacity is 125K bytes or 250K bytes for both sides with double density (500K byte) capability. A "write protect" mechanism is available to assure "read only" status.

Micro-Floppydisk cartridges are low-priced and the new drive unit is only \$899.

For further information, write or phone: Amdek Corporation, Marketing Dept., 2201 Lively Blvd., Elk Grove Village, IL 60007, (312) 364-1180. Tlx 25-4786.

#201

COPY-TAPE

COPY-TAPE is a utility program used to duplicate BASIC or system

tapes. Make back-up copies of your software on both the TRS-80 Model I and Model III. On the Model III. COPY-TAPE converts 500 to 1500baud and vice versa. It is menudriven and extremely easy to use. Options include load original tape, record new tape, verify tape and advance tape. COPY-TAPE presents the ASCII code of the program on the screen during loading and recording. Available for the TRS-80 computers Model I Level II and Model III, requires 16K minimum. The guaranteed cassette tape sells for \$11.95 and is available from Modtec, Software Division, 4144 N. Via Villas, Tucson, AZ

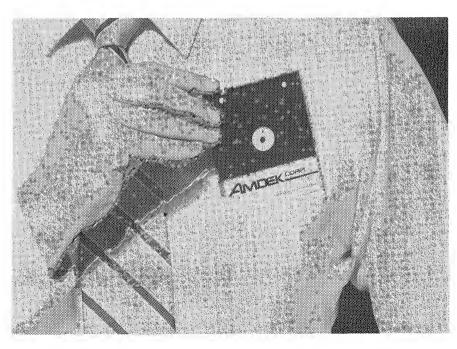
#202

COLOR-FORTH

COLOR-FORTH for the TRS-80 Color Computer (6809) is now available. Prices are \$58.95 for the RAM version and \$123 for the ROM plus RAM version. Included with the ROM are instructions for installing it in the disk controller, or it will work in a ROM cartridge.

COLOR-FORTH works with both disk and tape. The ROM version will work with 4K of RAM. The RAMbased version requires 16K.

COLOR-FORTH comes with a powerful Semigraphic-8 editor and a set of utilities. It has a unique trace feature, and handles interrupts cleanly in high-level Forth. COLOR-FORTH maintains the CPU carry



flag, for easy implementation of extended math, and has words for bit manipulation, graphics, sound, task multiplexing, fast math, autorepeat keys, control keys, disk and tape control and linkage to BASIC routines.

COLOR-FORTH was written largely in assembly language, and it takes advantage of the unique features of the Color Computer. COLOR-FORTH does not affect normal operation of the Color Computer.

For more information contact: Hoyt Stearns Electronics, 4131 E. Cannon Dr., Phoenix, AZ 85028, (602) 996-1717.

#203

Low priced 212A-compatible modem from Radio Shack

Radio Shack now offers a high-speed direct-connect modem that operates at either 0-300 or 1200 baud. The new TRS-80 DC-1200 High Speed Direct Connect Modem (76-1005) is available for \$699; an optional add-on auto-dialer accessory module (76-1009) is also available for \$149.95.

With high speed operation, time charges (and in some cases, affiliated long distance charges) may be greatly reduced.

The DC-1200 Modem can operate asynchronously at 0-300 baud (Bell 103/113 compatible). Both full- and half-duplex operation are supported at both speeds. The unit features manual originate (plus auto-dialer option available), automatic answer operation, and is self-adjusting to the incoming baud rate. A self-test mode has also been incorporated, as well as eight LED status indicator lights. Connection to TRS-80 computers is made to its DB25 connector with standard RS232C cables.

For futher information contact your local Radio Shack Computer Center.

#204

COLORTEXT

MICRO SCHOOL PROGRAMS announces COLORTEXT, for use on TRS-80, 32K Color Computers, with one disk drive. COLORTEXT is an easy-to-use, high-resolution text driver which displays a variety of

character fonts and graphics on the screen simultaneously, including the use of all features of Extended BASIC. It permits the intermixing of upper-lowercase text and graphics in various sizes and colors.

Other features include nondestructive overwrite for animation, variable screen scrolling speed, a BREAK key lock-up option, and ADDCHR - a program for creating and editing all characters, (including graphics, alphanumeric, etc.). ADDCHR can be used to create character sets of up to 200 characters. The defined character sets may be for foreign languages such as Greek, Hebrew, Russian, or various other print types. Special characters may also be defined and displayed within standard print statements.

The TRS-80 Model III graphics character set is included in COLORTEXT. This permits the user to enter and use programs written for Models I and III very quickly, using the same graphics character set numbers used in the other programs. This character set may be changed by the user if desired.

COLORTEXT comes on disk with a fifty-plus-page manual priced at \$79.80. For further information contact: BERTAMAX, Inc., 101 Nickerson, Suite 202, Seattle, WA 98109, (206) 282-6249.

#205

Double Density Adapter

The Holmes DX-1D Double Density Adapter adds double density and eight-inch drive capacity to the TRS-80 Model I for only \$129.50. Double density, eight-inch drives for the Model I require faster system speed and it can be achieved using the Holmes Sprinter II.

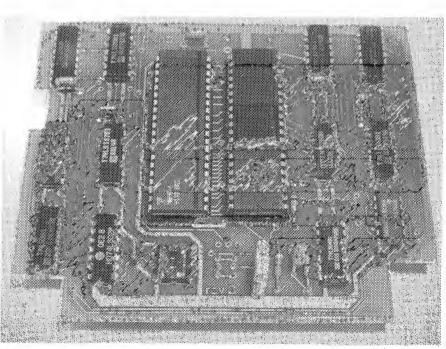
Designed for use in the TRS-80 Model I, the DX-1D can be used with the Radio Shack Expansion Interface, Holmes DX-1S single density disk controller, and other single density Model I compatible disk controllers.

Complete with a "state-of-the-art" LSI Data Separator, this new product offers greater disk storage, fewer read errors, and greater long-term performance than other controllers.

This product with the Holmes Expansion Mainframe and DX-1S Single Density disk controller provides a complete double density disk controller for \$319.

The Double Density Adapter is available through Holmes Engineering, Inc. or any of its authorized dealers. For more information call or write: Holmes Engineering, Inc., Dept. #20, 3555 South 3200 West, Salt Lake City, Utah 84119. (801) 967-2324.

#206



Exploring VisiCalc

Models I/II/III/16, PMC-80, LNW80

Tim Bowman, Spokane, WA

The VisiCalc program is best known for its ability to perform calculations and allow the user to consider questions like, "What if..." This month, let's use VisiCalc to do some things that you may not have considered using it for: text processing and forms creation.

Text Processing

Believe it or not. VisiCalc can be used as a very adequate text processor and it is very easy to use. All that you need to do after loading the program is to set the column width equal to fifty-five by typing /GC55 ENTER. Then, begin typing. It is important to remember that the regular VisiCalc commands govern the input of text material. For example, if you wish to begin a sentence with a non-alphabetic character, you must type a quote sign (shifted 2) before typing the text material. It is also important to note that while typing in text on the edit line, you can type many more characters on the edit line than will actually print on the screen or a lineprinter.

The power of VisiCalc comes into play when you want to enter additional lines of text in the middle of existing text. This is done by typing /IR and typing the text to be inserted. Similarly, you can delete lines of text by typing /DR. For those of you with the older version of VisiCalc, you do not have a line edit

capability, so if you wish to edit a line, you must type the whole line over again.

In order to properly position the output on a lineprinter, so that it does not print the left margin on the left edge of the paper, you will have to either shift the paper in the printer to the left, or start typing the text after ten or twelve presses of the spacebar.

In any event, VisiCalc can serve as an emergency word processor, or, for the budget-conscious person, an inexpensive text processor.

Forms Creation

In my occupation, I have discovered that we use a number of forms and that VisiCalc can be used to easily create forms. The reason VisiCalc can create forms so easily is due to its replicate command. Before you try what I suggest next, I would encourage you to refresh your memory and review your VisiCalc documentation of the replicate command.

If you wish to save any text that you created using the preceding tip, now is the time to save it. Type in /CY and /GC5 to set the column width at five spaces. We'll create a simple form to keep track of time by job. Type in the information shown in Figure 1. Be sure to provide the spaces after any quotes in order to get the proper character alignment.

After Figure 1 has been typed in,

the real power of the replicate feature can now be used. With the cursor at position B6, type /R.K6 DOWNARROW ENTER B18 ENTER. After the enter key is pressed, you should see the screen fill the cell positions with the replicated material. I've found that it is faster than any word processor at duplicating repetitive material, such as lines or boxes, or any other characters. The reader who is familiar with the replicate command will also see other uses of that command while typing in the detail in Figures 1 and 2.

To finish out the form, type in the additional information as shown in Figure 2, with your cursor beginning at position C19.

After you have typed in Figure 2, your final product should look like Figure 3. I have found that I like more space between the empty lines, so I use the insert command (/I) before any line that I wish to have more space. The example in Figure 3 is relatively simple, but by using a little imagination, I am confident that you can create useful forms for your own use.

Ed. note: Correspondence for Mr. Bowman should be addressed to Mr. Tim Bowman, c/o 80-U.S. Journal, 3838 S. Warner St., Tacoma, WA 98409. Be sure to include a SASE if you desire written response.

Figure 1

		, I Iguic I	
Location	Information	to Type	Comment
F1	"Sampl	Rightarrow	
G1	"e Com	Rightarrow	
H1	"pany	ENTER >B2	
B2	"/	Rightarrow	
C2	"/	ENTER >F2 (or Rightarroy	w 3 times)
F2	" Time	Rightarrow	
G2	" Summ	Rightarrow	
H2	"ary	Rightarrow Rightarrow	
J2	/	Rightarrow	Creates a
K 2	/	ENTER >B3	Repeating Label
B3	$^{\prime\prime} \mathrm{Week}$	Rightarrow	Title
C3	"Ended	Rightarrow 7 times	
$\mathbf{J}3$	" Na	Rightarrow	
K 3	"me	ENTER >B5	
B5	"Depar	Rightarrow	
C5	"tment	Rightarrow	
D5	" Name	Rightarrow Rightarrow	
F5	" M	Rightarrow	
G5	" T	Rightarrow	
H5	" W	Rightarrow	
I5	" T	Rightarrow	
J5	" F	Rightarrow	
K 5	''Total	ENTER > B6	
B6	/	Rightarrow	
C6	/	Rightarrow	
D6	/	Rightarrow Rightarrow	
F6	"	Rightarrow	
G6	″ -	Rightarrow	
H6	″ -	Rightarrow	
16	′′	Rightarrow	
J6	″ -	Rightarrow	
K6	″	ENTER > B6	
		Figure 2	
Location	Information	to Type	
C19	"Total	Rightarrow	•

Location	Information t	о Туре
C19	"Total	Rightarrow
D19	" Hour	Rightarrow
E19	"s	Rightarrow
F19	″====	Rightarrow
G19	″====	Rightarrow
H19	″====	Rightarrow
I19	"====	Rightarrow
J19	"====	Rightarrow
K19	″=====	ENTER

/ Week Ended	Sample	gure 3 e Comj Summ	pany			 Name
Department Name	M	\mathbf{T}	W	\mathbf{T}	\mathbf{F}	Total
Total Hours						
Iour Hours	====	====	====	====	====	=====

FOR TRS-80 MODEL I OR III IBM PERSONAL COMPUTER

- ★ MORE SPEED 10-20 timee faster than interpreted BASIC.
- MORE ROOM
 Vary compact compiled code plus VIRTUAL MEMORY makes your RAM ect larger. Varieble number of block buffere. 31-char.-unique wordnames use only 4 bytes in header!
- MORE INSTRUCTIONS
 Add YOUR commands to Its 79-STANDARD plus
 instruction set!
 Far more complete than most Forths: elngle & double
 precision, arraye, etring-handling, clock, graphics (IBM
 low-res. gives BM/ and 16 color or 200 tint color display).
- MORE EASE
 Excellent full-ecreen Editor, etructured & modular programming
 Word search utility
 THE NOTEPAD letter writer
 Optimized for your TRS-80 or IBM with keyboard repsete, upper/lower cese display drivar, full ASCII.
- upper/lower cese display drivar, full ASCIÍ.

 * MORE POWER
 Forth operating eyetam
 Concurrent interpretar AND Compiler
 VIRTUAL IO for video and printer, disk end tepe
 Full B080 or 8088 Aesemblar
 Event and the second of the seco



THE PROFESSIONAL FORTH SYSTEM FOR TRS-80 & IBM PC

(Thousends of systems in use)

AND MMS GIVES IT PROFESSIONAL SUPPORT

Source code provided MMSFORTH Neweletter Meny demo progrems eboerd MMSFORTH User Groups

mmno-unit mueer Groups inexpensive upgrades to latest version Programming staff can provide advice, modifications and custom programe, to fit YOUR needs

MMSFORTH UTILITIES DISKETTE: includes FLOATING POINT MATH (BASIC ROM routines plus Compiex numbers, Rectengular-Poiar coordinate conversions, Degrees mode, more), a powerful CROSS-REFERENCER to list Forth words by block and line; plus (TRS-80) a full Forth-etyle Z80 assembler (requires MMSFORTH V2.0, 1 drive & 32K RAM). \$39.95*

FORTHWRITE: fast, powerful word processor wieasy keystrokes, Help screens, menual & demo files. Full proportional witabs, outdenting. Include other blocks, documents, keyboard inputs, & DATHAHADLER fields—ideel for form letters (requiree MMSFORTH V2.0, 2 drives & 48K RAM) ... \$175.00*

MMSFORTH GAMES DISKETTE: reel-time graphics & board gemee w/sourca code. Includee BREAKFORTH, CRASH-FORTH, CRYPTOOUDTE, FREEWAY (TRS-80), OTHELLO & TICTACFORTH (requires MMSFORTH V2.0, 1 drive & 32K RAM)

Other MMSFORTH products under development

FORTH BOOKS AVAILABLE

MMSFORTH USERS MANUAL - w/o Appendices \$17.50°
STARTING FORTH - best! \$15.95*
THREADED INTERPRETIVE LANGUAGES - edvenced, analysis of FORTH internals
PROGRAM DESIGN & CONSTRUCTION - intro. to structured programming, good for Forth
FORTH-79 STANDARD MANUAL - officiel reference to 79-STANDARD word set, atc
FORTH SPECIAL ISSUE, BYTE Magezine (Aug. 1980) - A collector's item for Forth users end beginners \$4.00°

ORDERING INFORMATION Software prices include manuals and require signing of a single computer items to rone-person support. Dascriba your handwere, Add \$2.00 SH plus \$3.00 per MMSFORTH and \$1.00 per additional book, Mass orders add \$5% tax Foreign orders add \$5% UPS COD, VISA and M/C accepted, no unpaid purchase orders or refunds

Send SASE for free MMSFORTH information Good dealers sought

Get MMSFORTH products from your computer dealer or

MILLER MICROCOMPUTER SERVICES 61 Lake Shore Road, Natick, MA 01760 (617) 653-6136

59

Captain 80

The adventures of a software secret agent

© 1982, Bob Liddil, Contributing editor

Here's the Software Secret Agent, off on another deadly mission into the hinterlands of TRS-80 softwaredom. My top-secret equipment includes some of the old standards: a combination belt buckle telephone/modem and laser blaster in case of aliens, a ballpoint pen watch/microcassette recorder and standard top-secret, all-purpose, milk of human kindness gumdrop popper.

This mission was commissioned by none other than the CIA, (better known as Citizens against Interaction in Arcadia), committee on plots to reinstate adventure as the number one genre in microcomputer gamedom. The nature of the assignment was so secret that the guy who briefed me wasn't allowed to listen.

It was simple. All I had to do was investigate rumors that Scott Adams, who had launched a fully-computerized submarine, had been kidnapped by Blowhard, notorious international criminal, oil baron, shipping tycoon and litterbug.

It was true. Investigation revealed Adventure International's new Sea Dragon. The latest twitch by arcade geniuses Wayne Westmoreland and Terry Gilman created a great sigh of acceptance from video game affectionados. I must confess that I am among those who embraced this game enthusiastically.

Sea Dragon succeeds where Sky Warrior failed, as far as combining elements of different popular arcade games into a coherent, new activity. By going underwater with their scenario, the dynamic duo of diverse computanimation freed this offering of all but the most oblique similarities, to Defender and other coin-op twitches.

Here's how Sea Dragon works. The submarine is launched from shallow water into a sea of floating mines which (most inconveniently) float up to blow her to smithereens. Ah, but she is not without defenses. The forward tubes spit out an endless stream of deadly torpedos which are quite capable of destroying these mines. Chained, or unchained, they are worth points to the player.

As the cleverly-executed sea floor scrolls under her keel, Sea Dragon makes the briny deep safer for mankind. If this were all there were to the game, the terrific twosome would have scored a fair hit with me. But, not content to simply be good,

they added other elements.

First of all, air is not unlimited, so frequent surfacing is required. Also, the aforementioned scrolling seabed, which makes up the one-way course Sea Dragon must follow, is fraught with caves containing killer stalagtites which fall, and can do in undersea travelers. And, what submarine game would be worth its salt without battleships to blow up?

There are EATS (Enemy Attack Stations), which fire at random as you pass. Not an altogether safe way to travel, Sea Dragon, if you ask me. There is also a reactor (possibly owned by Blowhard, remember him?), that spews radioactive chunks and is protected by a large neutronium shield fabricated by a work force recruited from pronuclear plaque carriers at airports in seventy cities.

Sea Dragon's ability to blow things up extends to both the horizontal and vertical plane, and allows a lot of room for growth in skill level. Resident arcade munchkins have to be dragged away from the computer that contains this program. It is a winner, a challenge, an amusement, an achievement and a fair buy for the money, all rolled up into one neatly-

illustrated package, onto which the Adventure International nameless artist lovingly airbrushed a fine poster-quality submarine scene fit for hanging on a computer room wall.

All this was useful information as I set out to rescue Scott from the clutches of the guest Evil Villain of the Month—namely Blowhard. I would use my patented electromagnetic, microprocessor-equipped, infrared adventure grandmaster detector, and a cleverly-designed Bad Guy Buster, guaranteed to foil any evil plot.

When I arrived at Blowhard's mansion, I noticed that the lights were dimming. Was I too late? I raced through the corridors to Blowhard's laboratory. The fiend! He was torturing the Phooba of

Puzzles by making him read old twocolor documentation covers from Mad Hatter, Ramware and The Programmer's Guild.

I aimed my Bad Guy Buster squarely at the skulking torturer and fired, but the rays bounced off and melted my gun. Then, he ordered me to drop the BGB, or he'd turn up the power and torture poor Scott to death. I hesitated. He reached for a copy of Ting-Tong. I knew I was beaten. I capitulated. I dropped the BGB and surrendered.

"Ah, ha! I've beaten you, Captain," Blowhard cried triumphantly. As he opened his mouth and let out a squeal of pure joy, I let him have both barrels of my milk of human kindness gumdrop popper.

"Oh, no!" he yelped.

"Oh, yes, Blowhard!" says I.
"From now on, you will have to be kind to everyone you meet. No nasty letters, no dastardly deeds, no littering. The milk of human kindness gumdrops have no antidote."

He left the lab a confirmed dogooder, and the last I saw of him, he was heading for the coast in his Jaguar, ready to perform massive good deeds in the Orient. Another threat to humanity foiled.

I turned Scott over to the crew of the Sea Dragon for the long voyage back to Orlando. "Who was that caped crusader?" I heard him mutter, obviously still dazed from rereading the instructions to Journey to the Center of the Earth.

I chuckled to myself. A good day's work, well done, thought I . . . and wait until the CIA gets my bill.



Reviews

Speak Model I/III 48K with disk Model I version Order direct from author: Mr. Bill Neville, III P.O. Box 2581 Houston, TX 77001 \$39.95 Model III version: The Alternate Source 704 No. Pennsylvania Ave. Lansing, MI 48906 (800) 248-0284 \$39.95

Speak is a program which will "add lips to your TRS-80" computer. I have always wanted to have a program which could produce voices on my computer, but I have never been able to find such a program, until now.

The program itself will work only

on disk systems, and recording can only be accomplished using a Model III computer. Model I users can record voices if they bypass the Radio Shack tape recorder modification - this process is described in the Speak documentation. There are several programs on the disk, including Record, which allows me to talk to the computer to record my voice, Pack which lets me pack my voice into BASIC programs, and several demonstration game programs such as talking Hangman. Note that any voice can be recorded, since Speak can recognize and record any word.

How it works

After typing in Record from my DOS READY prompt, I may record in either the word or phrase mode. The word mode is used most often, since it is the only type that can be packed into my own programs. The only difference between these two modes is that in word mode, each word is packed into a string. Phrases are packed continuously into memory. Words in phrase mode are, in effect, "strung together" so that a sentence is stored, rather than a word. Usually, about eight words can be packed into any one phrase.

Recording is very simple since all I have to do is talk into the small microphone on my tape recorder. The computer will acknowledge each time a word is spoken by saying "word 1 recorded," "word 2 recorded" and so on. The buffer will be full after about eight or ten words. At this point, I save my words onto disk in a data file.

After saving I can pack my words into BASIC programs by using the



COLOR COMPUTER SOFTWARE

HELP FOR THE BASIC PROGRAMMER

At last, the development tools you need! All available instantly at power-up

MERGE COMMAND: Insert programs stored on cassette into your Basic program. You can even assign new line numbers to the file you read in. Create your own tape library! MOVE COMMAND: Lets you renumber any part of your Basic program GOTO's GOSUB's etc automatically changed .

AUTOMATIC LINE NUMBERING: You Il love this Never type in another line number PLUS 45 common Basic commands available as single key Control characters Or

change ANY OR ALL Keys to your own specifications! Comes with convenient easy to remove plastic keyboard overlay. All of this in a convenient ROM cartridge that uses almost once of your valuable memory.

CARTRIDGE \$34.95 none of your valuable memory

COLORCOM/E SMART TERMINAL PROGRAM

We didn't wait for the competition to catch up with us! We've added even more features to COLORCOM/E, our superb Smart Terminal program

- Complete upload & download support
 On line cassette reads & writes
 Automatic capture of files
 Pre-enter data before calling
 Selectable R5232 parameters

We've got the best cassette and upload/download support available. And you can conveniently print any portion of the received buffer you want. NOW ON DISK! Reads and writes files from disk. Same great features plus more DISK OR CARTRIDGE \$49 95

EDITOR ASSEMBLER DEBUGGER

CCEAD: This 8K Basic Program supports cassette files has full cursor control line insertion/deletion, and much more Two pass assembler supports full 6809 instruction set & addressing modes, lists to screen or printer Debugger allows memory examine /modify, program execution If not delighted return within 2 weeks for a full refund You get fully commented Basic source & complete instructions Requires Ext Basic & 16K CASSETTE \$6.95

CUSTOM CARTRIDGES: Put YOUR Basic program into a convenient ROM Cartridge Runs instantly at power-up. Use for Ad displays, schools, etc. Call or write for info

Send check, money order, or Visa/MC Number, Include \$1 for postage and handling, Visa/MC. Phone for fast service



P O Box 10234 Austin, Texas 78766 (512) 837-4665

62

Pack/Bas program. I can listen to each word and then decide if I want it packed or not. I am amazed at the clarity of the voices, they sound almost exactly as if I were talking. Once all the strings are packed into BASIC (an amount limited only by your memory — usually about fifteen words), the process of putting voices into my program is finished.

Using the words

Although only disk systems can use Speak, the voices may be reproduced on any TRS-80 Model I or Model III. Due to the limited number of words that can be packed into one program, games will probably make the best use of speak for saving things like "game over" and "you're dead." However, other applications can be practical. On a disk system many files can be saved and accessed quickly for teaching the alphabet and numbers or any other thing which is re-enforced by using real voices. Hundreds of words can be saved to disk ready to be used

later.

Although the voice sounds very much like my own, the speed may be changed so that I can sound like Mickey Mouse or a very old man. Every word is produced through the cassette AUX plug connected to an amplifier.

Speak is an excellent program with many applications. I have never seen a program of this type before, and I believe that programmers would find this especially helpful. Speak's clarity is excellent, and I highly recommend it to anyone wanting a way to put voices in their programs.

Tim Knight

Crayon
Model I/III,
PMC-80, LNW80
Pioneer Software
1746 NW 55th Ave. #204
Lauderhill, FL 33313
\$35 tape
\$45 disk

Pioneer Software, the maker of the

excellent "Scriptr" program, has come out with another impressive program. It is a program for the TRS-80 Model I/III owners with either disk or cassette and it is appropriately named Crayon.

It is named Crayon because it literally turns your screen and keyboard into just that. With the Crayon program, it is possible to draw and modify graphics on your TRS-80 screen. But that is only the tip of the iceberg, as far as Crayon's power goes.

In brief, here are some of the fine features of this program that took one and a half years to write. Crayon will allow you to typeset logos. For instance, if you are part of a company, say, "Acme Green Beans," you can use a simple command to get "Acme Green Beans" printed in bold graphics letters on your paper. Doing this is much less expensive than having the same job done at a printing shop. You don't even have to be part of a company — maybe you'd like your

STATEMENT OF OWNERSHIP,	DETAL SERVICE MANAGEMENT AND CIRCUL	ATION
1 TITLE DF PUBLICATION	A PUBLICATION NO	
80-U.S. Journal	0 1 9 9 1 0	3 5 1 Oct 82
3 FREQUENCY OF ISSUE	A HD. DF ISSUES PUBLISH	1 1
Monthly	AHHUALLY	PRICE
4 COMPLETE HAN IND ADDRESS OF MAN IND ADDRESS OF MA	12	\$16.00
4 CDMPLETE MAILIND ADDRESS OF KNDWN DFFICE OF PUBLICATION /S 3838 South Warner St., Tacoma, Washin	ilrest City County State and ZIP Code) (N 1940n 98409	ol printera)
5. COMPLETE MAILIND ADDRESS OF THE HEADQUARTERS OR GENERAL		
3838 South Warner St., Tacoma, Washin	gton 98409	
& FULL NAMES AND COMPLETE MAILING ADDRESS OF PUBLISHER, EDIT	DR. AHD MAHAGIND EDITOR (This Item A	EUST NDT be blank)
PUBLISHER (Name and Complete Melling Address) Irvin Mike Schmidt 3838 South Warner		
EDITOR (Heme and Complete Melling Address)		
Cameron C Brown 3838 South Warner St.	, Tacoma, Washington	98409
MANADIND EDITOR (Name and Complete Malling Address)		
7 DWNER (If owned by a corporation at a second of		
7 DWHER (If owned by a corporation, its name and address must be state owning or holding I parcent or more of total amount of stock. If not on be given If owned by a partnership or other unincorporated Irm, its name tion is published by a nonprofit organization its name and address must	when by a corporation, the names and add	
FULL NAME	CD MPLETE MA	ILING ADDRESS
Irvin M Schmidt Pres/Treas Kristine E Schmidt, Vice Pres	7574 68th Ave W. Ta	acoma WA 98467
Helene Schmidt, Sec	3611 S 10th St Taco	oma, WA 98405
	7574 68th Ave W. Ta	acoma wa 9846/
# KNOWN BONDWOLDERS MODEL ACCESS AND DE LES		
8. KNOWN BONDHOLDERS MORTGAGES AND OTHER SE TOTAL AMOUNT OF BONDS MORTGAGES O	CURITY HOLDERS OWNING OR HOLDING R OTHER SECURITIES (If there ere none, a	I PERCENT OR MORE OF
FULL NAME		ILIHD ADDRESS
NONE		
	-	
 FOR COMPLETION BY NONPROFIT ORGANIZATIONS AUTHORIZED The purpose function and nonprofit status of this organization and the exe 	TO MAIL AT SPECIAL RATES (Section mpl status for Federal income lax purposes	411.2, DMM only) (Check one)
HAS HOT CHANDED DURIND (2) PRECEDING 12 MONTHS PRECEDING 12 MONTHS	THS change with this s	sher must submit explanation of leternent)
PRECEDING 12 MONTHS PRECEDING 12 MON		ACTUAL NO COPIES OF SING
10. EXTENT AND NATURE OF CIRCULATION	AVERAGE NO COPIES EACH ISSUE DURING PRECEDING 12 MONTHS	FILING DATE
10. EXTENT AND NATURE OF CIRCULATION A TOTAL NO COPIES INM PRESS RUN)	SSUE DURING PRECEDING 12 MONTHS 24125	31000
10. EXTENT AND NATURE OF CIRCULATION A TOTAL NO COPIES ING PRESS RAW) E PAID CECULATION I BALET TRIGUIDN CEALERS AND CARRIERS STREET VENCOUS AND COUNTES SALES	24125	31000
10. EXTENT AND NATURE OF CIRCULATION A TOTAL NO COPIES INM PRESS RUN)		31000 13668
10. EXTENT AND NATURE OF CIRCULATION A TOTAL NO COPIES ING PRESS RAW) E PAID CECULATION I BALET TRIGUIDN CEALERS AND CARRIERS STREET VENCOUS AND COUNTES SALES	24125 7698	31000
EXTENT AND NATURE OF CIRCULATION A TOTAL NO COPIES INIA PRINC PAGE F POD CRECULATION WINDOM AND COUNTER SALED 1 MAIL SUBSCRIPTION 1 MAIL SUBSCRIPTION	24125 7698 12533	13668 14132
A TOTAL PIO CIRCULATION ATURE OF CIRCULATION A TOTAL PIO COPPE INM PINE RUN) F PIO CREVILATION F PIO CREVILATION TOTAL PIO CIRCULATION CAMPAIN STREET WINDERS AND CONCELLED AND CAMPAIN STREET TOTAL PIO CIRCULATION (Sum of 1981 per 1987) O THE CONTRIBUTION OF MAIN CAMPAIN OF THE PIONE TOTAL CIRCULATION (Sum of 1981 per 1987) TOTAL CIRCULATION (Sum of 1981 per 1987)	24125 7698 12533 20231	31000 13668 14132 27800
EXTENT AND NATURE OF CINCULATION A TOTAL NO COPPE IN A PARK RANJ F YOU CARCULATION OF THE STATE OF THE PARK CARRIES STREET YENGODA AND COUNTER BLEED T. MAIL PAUS CINCULATION (Form of THE PARK 1927) TOTAL PAUS CINCULATION (Form of THE PARK 1927) FREE CONTRIBUTION OF YEARS, CARRIES OF OTHER MEANS SAMPLES COMMERCHAND AND CONTRIBUTE COPPER TOTAL STREETING COPPESSION (AST TREETING) COPPESSION (AST TREETING) COPPESSION (AST TREETING) TOTAL STREETING COPPESSION (AST TREETING)	24125 7698 12533 20231 1180	31000 13668 14132 27800 1425
A TOTAL NO COPPE IN A PARE PLAY A WALL SAUGE CONTROLLED TOTAL NO CIRCULATION (Sum of rise and 1987) A PARE CONTRIBUTION OF WALL, CARRIED ON OTHER MAKES ANAMATE COMMERCIAL NA MOD OTHER PARE COPPE TOTAL CORT RESULTION COPPER SOT CASTRIGUTED TOTAL CORT RESULTION COPPER SOT CASTRIGUTED TATER MONITORISM TOTAL CORT RESULTION COPPER SOT CASTRIGUTED TATER MONITORISM TOTAL CORT RESULTION TOTAL CORT RESULTION TATER MONITORISM TOTAL CORT RESULTION TOTAL CORT RESULT RESULTION TOTAL CORT RESULT	24125 7698 12533 20231 1180 21411	31000 13668 14132 27800 1425 29225
EXTENT AND NATURE OF CINCULATION A TOTAL NO COPPE INM PARK RAN) F MOL CREVILATION F MOL CREVILATION CHARLES STREET *********************************	24125 7698 12533 20231 1180 21411 2309	31000 13668 14132 27800 1425 29225 1775



3111/2 8th - Suite 400

Glenwood Springs, Colorado 81601

VISA

Mastercard # 63

name printed in huge letters on your paper! Crayon allows you to create and run real-time cartoons. These are not shoddy, flicker-filled creations, either. Crayon has the power to run the cartoons you make at thirty-five screens (or frames, if you wish) every second!

In addition, this program will maintain a full disk directory for you, along with commenting and searches for your directory.

One of Crayon's main functions alllows you to draw anything on the screen you would like, and then save it to either tape or disk.

Also available with Crayon is the ability to keep an appointment schedule. Using the thirty-frame storage area, you may keep a full month's appointments on your system! I think this is an especially creative idea of Pioneer.

Crayon allows you to do virtually anything you would do with a video worksheet, but much more efficiently and effectively.

You use the screen as a drawing board, then send that drawing to your printer, tape or disk file. This is much easier to do than drawing out your picture on a graphics worksheet, then trying to transfer your picture from paper to computer.

Of course, using a cursor to form these pictures might get a little difficult, since the cursor is the same as the graphics. Pioneer has planned ahead for that. Crayon has a nine-character cursor that surrounds the character but never covers it and is always clearly visible in any display. Along with that, there are sixteen different commands for efficient graphics entry, for things like title pages and bar graphs.

Crayon can work in conjunction with another fine program from Pioneer Software called Scriptr. Using the two together, you can load in a picture from Crayon, temporarily halt the printing of Scripsit, then send the picture directly to your printer!

The thirty-screen buffer is another handy item to have, especially considering the imaginative possibilities. Lists and records can be kept within the thirty-screen buffer, which may also be used to print mailing labels! Crayon certainly is a number of great individual programs rolled up into one package.

Using Crayon as a text or graphics processor is well supported by many sub-commands. These are all covered in the easy to understand forty-page documentation. These commands include functions for deleting, inserting, exchanging and inverting graphics. One might think that with all of those graphics within a print-out, that print justification (the alignment along the side of the paper) would be lost. Not so! Crayon makes sure that no matter how many graphics you create, the print-out will remain justified.

Crayon is a professionally done program. It has fine documentation, excellent versatility and great features. If you work with graphics, either on the video screen or paper, I recommend that you buy Crayon. It





is very reasonably priced, and certainly well worth it. In my experience with Pioneer Software, they are courteous and willing to answer any questions you might have about their software. These things — good software, good documentation and good software support — are what make purchasing and using software enjoyable. Crayon is a superb program. If you think you might need anything like it, buy it.

Tim Knight

BETA-80
Model I
MECA
56677 Sunset Avenue
Yucca Valley, CA 92284
(714) 365-7686
\$699 single density
\$849 double density

One of the most persistent, and potentially expensive, problems

microcomputer users run into is how the heck he or she is going to store programs and data. The ubiquitous tape recorder is slow, error prone, generally cumbersome to operate, has limited storage and retrieval capabilities, and is quite inexpensive. One the other hand, floppy disk systems are very fast, much less error prone, computer operated, have excellent storage and retrieval qualities (90K to multimegabytes), and are very expensive!

These alternatives are also true for TRS-80 owners. To make the leap from cassette to disk involves the purchase of an interface (\$299 without memory), one or more disk drives (\$495 from Radio Shack, as low as \$300 from some sources) and disks (about \$5-8 per disk usually). That's over \$800 for 90-120K bytes of storage! When my time of truth arrived, I was bound and determined to find effective mass storage at low cost.

I pored over computer journals and searched computer stores for months before I learned about a small company in California called MECA. They had just begun production of a digital cassette storage device called the BETA-80 which was designed to interface directly with the TRS-80 Level II. The promotion literature promised 512K bytes of formatted storage on two tracks per drive (256K per trackin 1000, 256-byte blocks) and up to four drives on-line at once. Each track could hold up to sixty-four file names, which could be used to access any combination of BASIC. machine language program or data. The BETA-80 has its own microprocessor and runs asynchronously. This means that it runs independently of the main computer and communicates with it in much the same way that a terminal might, a very nice feature. Access time to any point on any track is thirty-six

AUTOMATED ELECTRONIC MAIL PICK-UP & DELIVERY

electronic

A PERFECT TRIO - The Hayes Stack Smartmodem, ACEMAIL, and the TRS-80 Now you can access other computers and information systems nationwide over the telephone!

The unique Automated Computer Electronic MAIL package allows you to send and receive ASCII files from your COMPLETELY UNATTENDED TRS-80! The new, highly sophisticated version 1 4 works in conjunction with the popular Hayes Stack Smartmodem featuring auto-answer/auto-dial, RS232C compatability, 0-300 baud, 7 LED indicators, an audio monitor, over 30 commands, and is programmable in any language. ACEMAIL operates with

NEWDOS/80 or DOSPLUS and is supplied on 'tiny DOSPLUS - ready to run!

HAYES STACK SMARTMODEM - \$239 ACEMAIL SOFTWARE 1.4 - \$79

NEW! 4 TIMES FASTER!!! SMARTMODEM 1200 - \$649

ACEMAIL 1200 - \$119

ACE COMPUTER PRODUCTS
OF FLORIDA, INC.

1640 N.W. 3rd St. Deerfield Beach, FL 33441 Data (305) 427-6300/Voice (305) 427-1257

66

MC/VISA accepted FL res add sales tax Freight incl (UPS ground-Cont USA)

1-800-327-2283

Convert Your TRS-80* into a World Class Computer

THAT REDUCES EYE FATIGUE AND DOESN'T FLICKER

- with LSI's new Soft-View ™ Replacement CRT -

The black & white "TV Screen" CRT (picture tube) which came with your TRS-80* is an inexpensive rapid "P4" Phosphor CRT intended for TV use. The display is actually strobing 60 times a second. No amount of "green plastic" will stop this strobing or eliminate the eye fatigue it causes. But a new Soft-View CRT display tube with a slower decaying, colored Phosphor will.

- Available in slow-decay green (similar to new IBM* and APPLE III* monitors) or medium decay "European Orange" (easy on the eyes, elegantly beautiful, and the standard for CRT displays in Europe).
- · Leaded glass stops X-ray emission.
- Optional Anti-Glare Frosted Glass available to reduce eye strain from glare.
- Easy installation tubes come with pre-mounted hardware.
- 30-Day Money-Back Guarantee, 1 Year Warranty.
- Ideal for Word-Processing & Programming, fast enough for Games & Graphics.
- Finest quality double-dark glass and phosphor fields make the letters seem to be coming out of black space.



LSI SYSTEMS Soft-ViewTM CRT's:

- #GN42 Graan Phosphor \$79.95
- #GN42G Green Phosphor with anti-glara \$89.95
- #OR34 Oranga Phosphor \$89.95
- □ #OR34G Oranga Phosphor with anti-glara \$99.95 ADD \$7 FOR PACKAGING AND UPS SHIPPING.

Langley-St.Clair To Order Call:

Instrumentation 1-800-221-7070
Systems, Inc. Or ask your Local Dealer.

132 West 24th Street, New York, N.Y. 10011 212-989-6876
18M, APPLE * and TRS-80* ara tradamarks of IBM, APPLE Computar
& TANDY Corp.

67

seconds maximum and usually much less. This combined with the fact that the computer does the searching for files by name or location (provided in the directory) made this very attractive in a cassette-based system. Then came the clincher; no interface is necessary and \$699 for the first drive! Drive two costs \$499. (Ed. note: A new double density version is available for \$849 for drive 1 and \$649 for a second drive — capable of over one megabyte of storage.)

This sounded like the answer to my prayers. The operating system allowed all cassette commands to be programmed into BASIC programs as well as by machine language and direct BASIC commands. I sent off my money and waited for it to arrive by UPS. I scanned the manual for any obvious no-nos and plugged the unit into my keyboard. The machine is self-booting just like disk and worked perfectly the first time! The instruction manual, when you get around to reading it, is complete with very good hardware and

software sections. There are numerous examples to try and directions for approved modifications to suit special needs. This is one company that is not afraid to have their equipment looked at and altered. They have sent me annotated source listings for the O.S. and complete schematics. They even have an open royalty proposition for modifications and programs sent for appraisal.

Within a few hours, I had loaded all my programs from the ridiculous pile of tapes on my desk onto two tapes (one working, one backup) with two-thirds of both tapes still empty.

I have owned my BETA-80 for well over a year now, with no more than a handful of lost bytes, usually my fault. In that time, I have acquired a second drive and modified my tape version of Scripsit to run on the BETA-80. This is available to owners of Scripsit for \$20 plus shipping (\$25 for a version that allows selection of typing mode for printers such as the MX-80). MECA

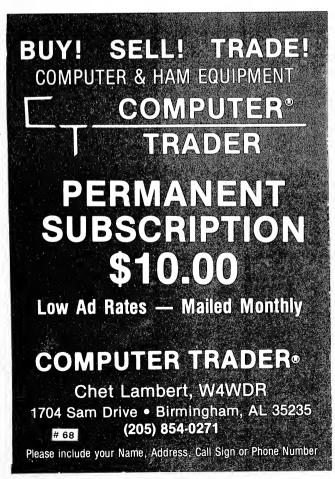
also makes available to registered owners of G2L3 Level III BASIC (Ed. note: from Microsoft, Inc. Bellevue, WA), a self-booting version that gives BETA-80 owners all the power of Disk BASIC at half the cost. Incidentally, I never bothered to get an expansion interface.

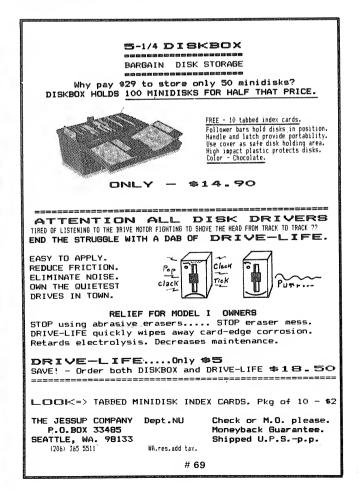
Mark A. Schimelman

6809 Assembly Language Programming Lance Leventhal Osborne/McGraw-Hill \$16.99

When the Motorola 6809 chip was first introduced, I was chomping at the bit to find out more about it. I questioned engineers about it and was impressed by what I heard. When I heard the Color Computer was going to use it, it became imperative for me to learn more.

I collected all the technical information I could, but nothing I collected came close to comparing with the completeness and usefulness of Leventhal's 6809





Assembly Language Programming.

It's a hefty book, filled with a large amount of information about the 6809 and various peripheral chips that the programmer has to know about. There's also a large amount of information on general assembly language programming which is useful even to the professional programmer. If you already have some of the Osborne/McGraw-Hill books on various microprocessors. you're already familiar with some of the information.

I've been using the book as a general reference for programming the 6809 and I've never had a real problem with it. It did take me awhile to figure out some of the intricacies of the processor such as the post byte, when to expect it and when not. Here, I got more from the programmer's card for the 6809 than from Leventhal's book.

I can't claim comprehensive application of everything in the 528 pages, but of those instructions I have used, it hasn't lead me wrong.

T.R. Dettmann

Outhouse By J. Weaver, Jr. **Soft Sector Marketing** 6250 Middlebelt Garden City, MI 48135 Model I/III, \$15.95 cassette \$19.95 disk

An arcade game about an outhouse? You've gotta be kidding! Nope — this is Outhouse, Soft Sector M's hilarious new entry into the "original arcade game" category of TRS-80 software.

Actually, the game itself is not hilarious - just the concept of protecting an outhouse and its contents from thieves and aliens bent on destroying your ship and the outhouse below. The outhouse begins with 200 feet of paper. The enemy attacks you in waves, and after each wave that you survive, you are awarded bonus points based on how many feet of paper remain. After every fourth wave, you are also rewarded with a fifty foot roll of paper, although your total cannot exceed 250 feet.

By now, you are surely wondering what types of villainous vandals are attacking the outhouse, and what you, as a concerned citizen, can do to save the paper and the outhouse from certain destruction. First of all, there are seven different types of enemy creatures. Fireballs and rotors will try to destroy you by colliding with you. Anglers and crunchers will try to obliterate the outhouse by crashing into it. Zappers will try to destroy you by firing a laser at you. Thieves will run toward the outhouse and run out of it with the loose end of the paper, unrolling it until they leave the screen. Squatters will run toward the outhouse, enter it, use up about five feet of paper and leave.

In order to protect yourself and the outhouse from these vicious varmints, you ship is armed with a laser which never runs out, and three smart bombs, which destroy all aliens on the screen.

The game starts out fairly slow, but gets progressively faster and harder. After about wave eleven, it gets so fast that it is almost physically impossible to destroy everything without using a smart bomb. I honestly cannot remember the last computer game that I have played that was so fast moving. It really tests your skill and coordination.

So, what we have here is a game that is fast and funny. But is it a good game? I have played a few fastaction games that just did not appeal to me. Fortunately, Outhouse is not one of these. There are enough different types of aliens to give the game variety and hold your interest. There is enough variance in speed to provide a seemingly endless challenge.

The controls for Outhouse are rather difficult to master. They are similar to those of Big Five's Robot Attack, and consist of using the arrow keys for movement, any number key for a smart bomb, and the space bar and arrows for firing. The way the firing works is that you simultaneously press the space bar and the direction that you want your laser to go. It is not that hard once

SAVE MONEY ON YOUR TRS-80® COMPUTERS



TRS-80" Model 16

Jimscot Inc. 1023 N. Kansas — Box 607

Liberal, Ks. 67901 is the registered trodemark of Tandy Corporation 1-800-835-9056

Kansas Residents — 316-624-1919 (collect)

CHECK WITH US AND SAVE

- ✓ Visa or Mastercard
- ∠ Bank Cashier's Checks
- ∠ Bank Money Orders
- Bank Wire Tranfers
- We now carry telephones and telephone answering systems!







ARRANGER

100% Machine Language Disk Index Program for the TRS-80 Model I&III.

Automatically recognizes ALL major DOS's!

The Arranger is a master index system that automatically records the names of your programs, what disks those programs are on and type of DOS. Features include -

- · Automatic single and double density recognition.
- Accepts LDOS, DOS+, TRSDOS DBLDOS, NEWDOS/80, MULTIDOS
- Works interchangeably with Model III, I double density
- Capacity of 200 disks, 44 filenames/disk
- · Quickly locates any amount of free granules
- Finds a program in less than 30 seconds!
- Alphabetizes 1500 filenames in 40 secs.!
- Option to sort by any extension (/BAS, /CMD, /???)
- Easily updates diskettes previously added with only 2 keystrokes.
- · Backup function built in.
- Uses 1 to 4 drives, 35, 40 or 80 tracks.
- · Radio Shack doubler compatible Requires 32k

1 disk minimum

JUST \$29.95 FREE SHIPPING

Specify: TRS-80 Model number (If you've added double density to your Model I, please indicate)

70

TRIPLE-D SOFTWARE

P.O. Box 642 Layton, Utah 84041 (801) 546-2833

VISA OR MASTERCARD

TRS-80* Models 18 111



Discount Prices!

Great Gift Ideas for Christmas! Your Cost

	rour Cost
For Little Kids (Ages 4 - 10) Little Red Riding Hood (Adv. Int.) Old McDonald's Farm (Adv. Int.) Twas the Night Before Xmas (Adv. Int.) The Playful Professor (Med. Sys.)	Tape/Disk 11.90/ - 11.90/ - 11.90/ - 11.90/14.30
For Big Kids The Eliminator (Adv. Int.) Reign Red Dragon (Adv. Int.) Star Fighter (Adv. Int.) Crush, Crumble & Chomp (Auto. Sim.) Defense Command (Big Five) Robot Attack (Big Five) Panik (Fantastic) The Institute (Med. Sys.) Laser Defense (Med. Sys.) Strike Force (Melbourne)	15.90/19.90 - / 19.90 19.90/23.90 23.90/23.90 12.70/15.90 15.90/18.30 11.90/14.30 13.55/16.95
For the Office Personal Check Mgr. (Adv. Int.) Mail List (Precision Proto.)	- / 19.90 - / 71.90

Electric Webster (Prosoft) - /119.60Newscript 7.0 (Prosoft) Newscript 7.0 & Labels (Prosoft) -199.90

Check reader service for our catalog.

RIMES COMPUTER PRODUCTS

262 Tracey, Dept. 12B Grand Island, N.Y. 14072 (716) 773-2519

Add \$1.50 for U.S. shipping. Add \$1.50 for COD Add \$4.50 for Canada or Mexico For fastest service send M.O or cert check, Mastercard/Visa also accepted Allow 2 weeks for personal checks # **71** New York Residents add sales tax *TRS-80 is a trademark of Tandy Corp

you get used to it, but it can take a while to get used to it. Outhouse is joystick compatible, although you must go back to the keyboard to press a number for a smart bomb.

The sound and graphics are good (although there is no crescent moon on the outhouse). The disk version has a very high quality voice and saves the eight highest scores to disk.

Outhouse - it is fun, fast and funny. It is, perhaps, Soft Sector Marketing's best game yet. After a day, you will like it. After a week, you will love it. Call SSM sick. Call them disgusting. Call them today and order Outhouse.

Matt Friedenberg

Black Sanctum **Color Computer** 16K cassette Mark Data Product 23802 Barquilla Mission Viejo, CA 92691 (714) 768-1551 \$19.95

If you think that creating a text adventure for the TRS-80 Color Computer is a waste of the many graphic features available then you've made a very grave mistake. Black Sanctum has none of that, but what it lacks in graphics is made up for in complexity and difficulty.

Black Sanctum is the thinking man's adventure. It has even stumped this author as of this writing (maybe I'll complete it by publication time). When I first heard about Black Sanctum I thought, "What a welcome relief a nice quiet adventure would be from battling space rocks and U.F.O.s." I should have known that anything Mark Data Products creates could not be taken lightly. Black Sanctum is definitely not for the novice at adventuring. Black Sanctum is puzzling, perplexing, problematic, delicate, ticklish and trying — but, most of all, Black Sanctum is fun.

Without trying to spoil the thrill of discovery, the idea behind Black Sanctum is to destroy the Evil Presence of an ancient, but not yet abandoned, monastary. Black Sanctum is *not* patterned after the popular Dungeon and Dragon type games. There is no fighting or combat in it. Black Sanctum challenges the player by putting him or her in a complex situation and saying, "Now what are you going to do!?" This is fine until one finally decides to do something, no list of the available commands is included. It's save game feature allows you to save the game's present condition out to tape (takes about five seconds) and then continue from that point sometime later.

Black Sanctum combines complex situations, fast machine language, and a helpful save game feature to make one of the most fun times one can have on the TRS-80 Color Computer.

Roy Seney

Electric Webster Cornucopia Software, Inc. P.O. Box 5028 Walnut Creek, CA 94596 Model I/III - \$89.50 Model II - \$149.50 Options: Correction Feature - \$60

Electric Webster is a second generation spelling checker, sometimes called Son of Microproof. Although patterned after Microproof, Electric Webster is superior in several areas. There are several possible configurations of the program; however, all testing was conducted on a 48K Model I with two 40-track, single density disk drives using the optional correcting feature integrated into the word processor, Newscript. It was also tested using a integrated copy for Lazy Writer. Electric Webster can also be incorporated into Electric Pencil version 2.0, Scripsit, and Superscript. It can be used manually from DOS when using the older Electric Pencil, Copyart, Pensadyne and all other word processors. The integration feature is handy because the user never has to leave the word processor to invoke the spelling checker. The corrected text is automatically renamed and Electric Webster returns you to your word processor.

The standard Electric Webster operates by comparing the words in the working document against the words contained in its 50000 word dictionary. All words that are contained in the dictionary are

listed out on the screen or optionally, on a printer. This list of words becomes a list of "potential errors." I say potential, because a word will appear in the list if it is spelled correctly but not contained in the dictionary. Proper names, plural forms of nouns, and many technical buzzwords are not included in the original dictionary. You then take the list of potential errors and correct the document using the global search and replace features of your word processor. This method is probably sufficient for those who do not have a large amount of material to proof; but, if you do a lot of writing, the optional correction feature would be a wise investment.

Using the optional correction feature is very handy and simple. After the list of potential errors appears, the user hits the ENTER key and is presented with the first word that was identified as an error. The user has six options at this point, each one requiring only one keystroke. The first option is simply to leave the correctly spelled word "as is" without adding to the dictionary. If the word is correctly spelled and will be commonly used in the future, you may decide to add the word to the expansion dictionary. This allows the user to tailor the dictionary to specific needs. If you know the correct spelling, correct it by simply typing in the word and hitting ENTER (option three). The fourth option is to simply exit the correcting feature once all of the necessary corrections were completed.

Options five and six require a bit more explanation and are features that make Electric Webster unique. You may be unsure of the correct spelling and can choose to display the dictionary. After hitting the proper key, you are presented with a list of words in the dictionary, with words above and below where the word in question would appear. Electric Webster actually shows you where that word would appear in relation to several words on either side of it. You can then scroll forward or backward through the dictionary in order to find the correct spelling. This feature is extremely useful if the misspelled word is very close to the correct spelling. Most of the time, the word will appear in the

close proximity on the displayed dictionary. If the correct word is found, another feature allows you to scroll the dictionary until the proper word appears on the bottom line and by hitting a key, will automatically replace the misspelled word.

Another handy feature covers when you know the word is misspelled, and are unsure of the correct spelling. Type the proposed new spelling, preceded by an "@." If it is already in the dictionary, it will automatically replace the misspelled word. If it is not correct, Electric Webster will take you to the part of its dictionary where the new spelling would have appeared.

The last option is to ask to see the word displayed in context. Here you have the opportunity to see where the word appears in relation to a small portion of the text. However, the only options available while in this mode are to leave the word "as is," type in the correct spelling, or leave it "as is" and skip all subsequent context displays of that particular word.

After all of the words are proofed, the dictionary is automatically expanded and then the corrected text is either written over the original text or a backup copy is made. The entire process is transparent to the user and if disk swapping is necessary, the program prompts you on which disk to insert. On a two-drive, single density computer, four disks are involved: Your normal word processor, the Electric Webster system disk, the dictionary disk and your text disk. On a double density system, disks three and four can be combined. Single-drive owners can also use Electric Webster by swapping disks more often.

The most outstanding feature is its speed. It took a total of seventy-four seconds to produce the list of potential errors for a 2000-word text. Another impressive feature is the compactness of the dictionary. The 50000-word dictionary fits into only 104K of disk space. Electric Webster is truly a state-of-the-art product that performs flawlessly and effortlessly. If you need a spelling checker and have not purchased one as yet, Electric Webster is certainly an outstanding choice.

Jim Klaproth



If you use a Word Processor, you need

GRAMMATIK"

Beyond Spelling Checking

Grammatik can find over 15 different kinds of common errors missed by simple spelling checkers alone, including punctuation and capitalization errors, overworked and wordy phrases, and many others. Use Grammatik with Aspen Software's spelling checker Proofreader, featuring the Random House Dictionary®, or with your current spelling checker for a complete document proofreading system.

Read what the experts say:

"The perfect complement to a spelling checker."

Alan Miller, Interface Age, 5/82

"A surprisingly fast and easy tool for analyzing writing style and punctuation."

Bob Louden, InfoWorld, 12/81

"Anyone involved with word processing in any way is encouraged to get this excellent program." A A Wicks, Computronics, 6/82

"A dynamic tool for comprehensive editing beyond spelling corrections." Dona Z. Meilach, Interface Age, 5/82

"A worthy and useful addition to your word processing software."
Stephen Kimmel, Creative Computing, 6/82

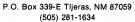
Works with CP/M®, IBM-PC®, TRS-80®

Grammatik \$75.00 Proofreader \$50.00

Order directly from Aspen Software, or see your local dealer. Specify your computer system configuration when ordering! Visa, Mastercard accepted.

Random House is a registered trademark of Random House, Inc. Other registered trademarks: CP/M: Digital Research - TRS-80: Tandy Corp. - IBM: IBM -- Proofreader, Grammatik: Aspen Software Co.

Aspen Software Co.



KOUPON KEEPER



Which do you prefer? No system for filing and retrieving coupons? Or a quick, easy to use index program that lets you review your coupons in 5 different ways? The choice is yours. For the TRS-80 1 & 3, LVL 2, just \$9.75 postpaid.

KENSOFT

2102 - 50th Street Kenosha, WI 53140

72

LARGECAPACITYSYSTEMSLAR SMALL & (REQ. 32K 2 DISKS) ECAPA

LARGE CAPACITY ACCOUNTS RECEIVABLE

FOR MODEL I/III 5000+CUSTOMERS

SLARGE

ECAPACITYSYST

C

15000+ TRANSACTIONS BALANCE FORWARD 99 TRANS CODES 30-60-90-120 AGED STATEMENTS SHOW DATE/INV#/DESCRIP/AMT (WITH AGEING) SELECTIVE FINANCE CHARGES & RATES RATES, FAST ENTRY, POSTING W/AUDIT REPORT SUB-ACCTS % OF CREDIT LIMIT. DATE OF LAST PAYMENT SALES ANALYSIS SPECIAL 90 DAY ACCOUNTS, LABELS

\$99.95

MAUAL ONLY \$30 00 TEST SET \$50 00

HOLMAN D-P SERVICE

3 00 S&H 5 2059 WEST LINCOLN VISA OR MC COD* OROVILLE CA 95965 916-533-5992 *COD (CASH, CERTIFIED, OK, MONEY ORDER)

2 emzfahcecadacilazazlem

73

Offer ntroductory **NEW FLIGHT** SIMULATION GAME WITH ADF NAVIGATION!

Mission-bomb and strafe. Take off, navigate by ADF/DME to target and back and land on runway. You might have a dogfight, stall, run out of fuel, overshoot landing...lots can happent instrument panel, air strip, fighters, etc. SUPER

...all in graphics.

7 personal programs including Income Tax, Mall List, etc.. **OVER \$100 VALUE!**

All for \$29.95 Disk only TM Requires 32K-TRS 80 M I/III Tandy **BAP\$ Software**

6011 San Felipe Houston, TX 77057

Reviews

Dunzhin Model I/III 48K tape or disk **Med Systems Software** P.O. Box 3558 Chapel Hill, NC27514 (800) 334-5470 \$29.95 + \$2 s/h

Dunzhin is part one of a trilogy of fantasy role-playing adventure games. (Ed. note: KAIV and The WYLDE are the other two.) Your goal is fame, fortune and retrieval of a precious object buried deep in the Dunzhin. Machine language programming makes this roleplaying adventure fast and furious.

You begin as a level one warrior armed with a magic wand. minimum armor, sword and treasure pouch to fill with goodies. Starting at the first level of the Dunzhin, you work your way down to the last level where the mysterious gift is kept. The Dunzhin varies from four to seven levels and contains fifteen rooms on each level. The rooms are arranged randomly in each adventure so there is no way to determine a pattern. Three of the rooms in the Dunzhin contain poisonous gas, three others teleport you to various places in the maze, and three more are regeneration rooms that heal you if you run into some trouble. There are also rooms scattered about to repair armor. weapons and recharge your wand.

Probably the most exciting feature of Dunzhin is its mapping



feature. As you progress the various levels, a map is automatically drawn. This map is never erased. Even if you got to a different level, when you return the map will still be there. The rooms are shown on the map with the letters A through O. You enter the room by placing your warrior directly on the letter. Be careful, Med Systems has thrown in some traps to add to the fun.

Movement is accomplished with a number for steps, and a letter for direction. For example, W9 would move your warrior nine steps to the West. If you have not been through this part of the maze you have no way of knowing where the walls are. Of course, you don't want to go too slow, monsters have a way of popping up.

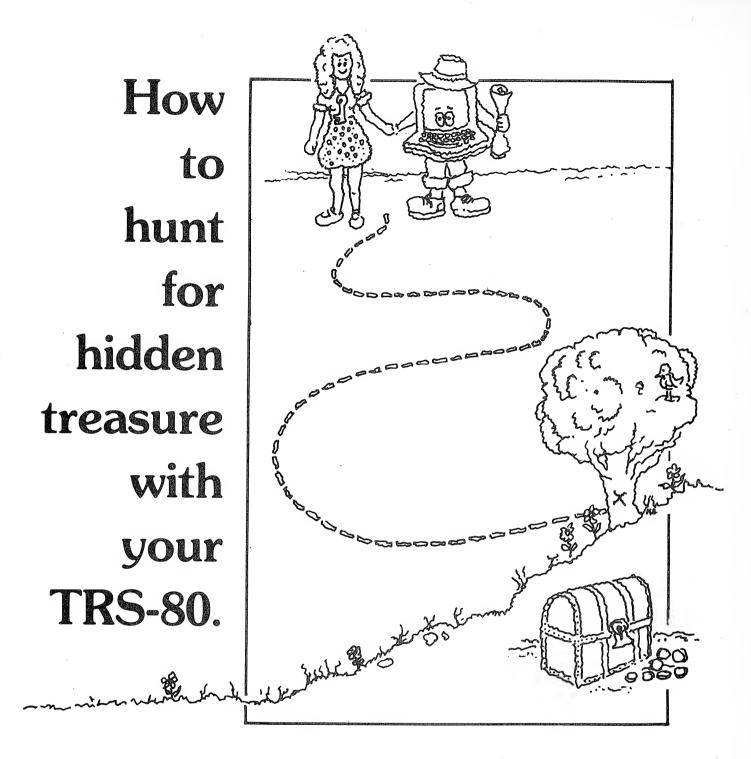
Monsters have three levels of difficulty and you might be confronted by one or five. Different parts of the body are easier to hit on different monsters. There is also a wandering thief who occasionally takes your treasure pouch. Occasionally, there is a fog which totally obscures the Dunzhin.

In all fantasy games battles are always the best part and that's also true in Dunzhin. When you encounter a monster, or many monsters, you can try to hide or run or fight. Hiding and running are randomly "rolled" or decided. If you're a Storm Bull and decide to fight, you choose a location - head, chest, leg, etc. — and start swinging. Again it's chance and skill that determines if you slay the enemy. Should you be lucky enough to fend off the enemy, you may move up the warrior scale. With each rank comes better armor, greater attack skill. and of course, tougher monsters.

Either Dunzhins or characters may be saved at anytime. A character can gain experience and then be saved to play in a different Dunzhin or the entire Dunzhin can be saved. You may save up to five of each. Saves are done at high speed and do not disrupt the play of the game.

The game is a must for fantasy role-playing adventurers. If you RuneQuest or Dungeons and Dragons, you should enjoy Dunzhin. It's fast, exciting and features most

of the ideas of role-playing games. Mark E. Renne



Captain 80 Book of BASIC Adventures.

Thar's GOLD in them thar plots! Eighteen tantalizing, challenging fantasy adventures in which YOU play the role of adventurer and hero! Finding treasures and achieving goals while trying to avoid deadfalls and other insidious obstacles are just a few of the things you'll experience in the Captain 80 Book of BASIC Adventures.

This 252-page book contains eighteen exciting adventures edited by Bob Liddil of The Programmer's

Guild. Seven chapters tell you the what, when, where, why and how of adventures, including how to play, write and sell your own programs. Although written for the TRS-80 Models I and III, these adventure programs will easily adapt to most computers using Microsoft® BASIC.

The highlight of this book is the Adventure Generator. This program requires disk BASIC and will actually write another BASIC program around your imaginative instructions!

Please send copies of the ADVENTURE BOOK for only \$19.95 each, plus \$2.05 shipping and handling. Check, M.O., VISA/MC# enclosed. C.O.D. orders accepted.		
Name	l	
Address		
City State Zip	l	
VISA MCExp Date		
Signature		
SEND TO: 80:NW Books 3838 So. Warner St., Dept. C, Tacoma, WA 98409 DEALER INQUIRIES INVITED		

Screen dump utility

A tiny word processor

Model I/III, PMC-80, LNW80

Alfred L. Brophy, III, West Chester, PA

A number of programs have been published that dump the contents of the TRS-80 screen to a printer. Some of them delete spaces, and others store the text to be printed in a buffer before printing it. Although these features can have some advantages, I wanted a screen-dump utility that dumps directly from the screen to the printer and provides an exact copy of the screen contents without changing the text in any way. I was also dissatisfied with the inefficiency of the programs that store every line in a string before printing it. I would rather have the text printed immediately, thus avoiding the use of any extra variables.

I decided to write my own screen-dump routine and, wanting to make it really concise, set out to write a one-line program. Here is the program:

20 FOR A=15360 TO 16320 STEP 64:FOR B=A TO A+63: LPRINT CHR\$(PEEK(B)); :NEXT BE:LPRINT: NEXT A

The program works by PEEKing into screen memory, and then LPRINTing the CHR\$ value of the memory location just PEEKed. After printing 64 characters, the printer advances a line and begins printing again. In this way the screen is dumped to the printer exactly as it appears.

If you are dealing with graphics, you might like to maintain about the same height-to-width ratio on the printer as on the video screen. To accomplish this, change the screen dump routine to:

20 FOR A=15360 TO 16320 STEP 64: FOR B=A TO A+63: LPRINT CHR\$(PEEK(B)); :NEXT B:LPRINT:LPRINT: NEXT A

This adds an extra linefeed between each line so the printout will be double spaced. The printout of a full screen will now be 6.4" wide by 5.3" high, about the same height-to-width ratio as the screen. This assumes that your printer is set to print ten characters per inch.

This routine has a number of uses. It can be called as a subroutine in programs that require minimal printer output. It can easily be expanded into the following word processor:

10 A\$=INKEY\$:IF A\$=CHR\$(13) THEN PRINT CHR\$(15);: GOTO 20 ELSE PRINT CHR\$(14);A\$;:

GOTO 10

20 (same as line 20 above)

The word processor works by using INKEY\$ to get keyboard input. It checks to see if ENTER, CHR\$(13), has been pressed. If ENTER has been pressed, the program turns off the cursor, CHR\$(15), in order to omit the cursor from the printout. It then proceeds to the screen-dump routine at line 20. If, on the other hand, ENTER has not been pressed, the cursor is turned on, CHR\$(14), and the INKEY\$ character is displayed. The GOTO statement at the end of line 10 repeats this process.

Now RUN the program. Type anything you want, up to one full screen. You can use the arrow keys to position the cursor to the spot where you want to type. See Table 1 for a description of the uses of the arrow keys and other control keys in this program. If you make a mistake, use the arrow keys to position the cursor over the character you mistyped, and type over it. When you want to dump the contents of the screen to the printer, press ENTER, which transfers control to the screen-dump routine. If you have a lowercase modification installed in your computer be sure to use your lowercase driver with this program, otherwise the PEEK values will not be correct.

Table 1

Tiny Word Processor Commands

Command	\mathbf{Use}
Backarrow	Backspaces cursor and erases
	character.
Shift backarrow	Backspaces cursor; does not affect
	any character.
Forwardarrow	Has no function.
Shift forwardarrow	Advances cursor one position;
Uparrow	Prints up arrow.
Shift uparrow	Upward linefeed; does not affect
	any character.
Downarrow	Places cursor at start of next line
	and erases that line.
Shift downarrow	Has no function.
CLEAR	Clears screen from cursor's posi-
	tion to end of screen.
ENTER	Dumps screen to printer.

106 80-U.S. Journal

Gompukids

Magazine and Club

(Special school rates available)

MEMBERSHIPS INCLUDE:

1 year magazine subscription Contests with GREAT prizes Free Computer Advice Program Exchange Educational Programsand lots more....

	One year subscription <i>plus</i> one year membership in CompuKids Club — \$24.00 (Canada — \$31.00) One year subscription only — \$16.00 (Canada — \$20.00) Six month trial subscription — \$9.00 (Canada — \$11.00) Payment enclosed (check or money order) Please bill me later (a \$1.00 billing fee will be added)							
N	Name							
A	Age							
Address								
		State						
Zip Code								
Signature (if billing)								

Mail check or money order today to:

CompuKids Magazine P.O. Box 874 Sedalia, Mo. 65301

Or Call TOLL FREE: 1-800-822-KIDS

122

Let's have a party

For children of all ages

For all models

Alan Mandell, Portsmouth, VA

So, you are going to host a birthday party for your child. Do you anticipate, with trepidation, several hours of high noise levels and chaotic destruction of your furniture? Perhaps there is a way for your child to have a successful party and for you to retain your sanity while protecting your property.

This article offers some ideas and programs for a different type of preteen party. By mixing computer-centered activities with other birthday festivities, you may be able to survive an indoor celebration with this age group.

The listings provide some program outlines which are built around children's party games. They provide opportunity for interaction with the computer. The listings are outlines of possible procedures. You will want to use them as models, and insert your own "forfeits" and "treasure hunt" clues. You can also add animation and sound to the programs, if you desire.

Listing 1 provides a program for Forfeits. Lines 1000-1010 grab the attention of the party goers. The OUT 255,4 and OUT 255,0 make it possible for taped music to be played while the graphics are displayed. You will have to change the length of the time loop T to fit the amount of music you wish to play. After the players enter their names (lines 20-25), the computer randomly picks a name and a forfeit to be performed.

Lines 100 and 110 are sample forfeits; you may want to change them after consultation with the party person about the nature of the intended guests. In any event, you should add more forfeits at lines 120 to 190.

The subroutine in lines 200 - 215 erases each player's name after it has been called for a forfeit. If you want to play the game again, the names of the players will have to be reentered. Incidentally, this game (appropriately modified) might add life to some of the parties you host for your own friends.

Listing 2 provides an outline of a "Treasure Hunt" game involving teams of guests. This can be another time consuming game if you have 10 clues that lead to 10 secret words. You enter the clues in lines 30, 35, 40, etc., and the checks for the correct secret words in line 100 to 900. Use the pattern of GOTOs shown in the model for the ones that you add. Be sure to have a prize for winning team. Between you and your spouse, you should be able to develop some tricky and clever clues and

secret words.

Listing 3 will randomly assign players to a team. This could be added to Listing 2 as a subroutine to pick the team members and perhaps protect everybody's feelings.

If the crowd isn't too large, you can load up some individual games and let each guest try to score the highest number of points. A possible disadvantage of computer games played by one person at a time is that the rest of the guests are not involved, except as spectators, and may invent things to do on their own.

Listing 4 offers a short program which will solve the problem of "who gets the first turn" in the individual games.

Don't overlook the fine opportunity for exercising your genius to create a computer birthday card (with several pages) which can be run at cake cutting time, perhaps accompanied by a taped version of the Happy Birthday song.

Some General Suggestions

For certain age groups, insist that you have lent all your space invasion type games to a friend or the party may be a failure in the opinion of your child. "All the boys wanted to do was zap aliens."

Keep the computer keyboard away from the food and drink area. Melted ice cream will really give you a keybounce problem that even KBFIX can't fix. Make sure your programs have long delay loops for reading directions, or use INKEY\$. Not everyone reads and comprehends at the same rate.

Mix up a computer activity with other non-computer activities to give yourself time to load the next program, while the crowd is busy elsewhere.

Plan to give prizes to the winners. This may add motivation to participate among the guests who would rather wrestle near your china cabinet.

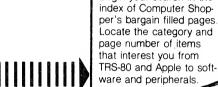
Know the nature and interests of your child and the expected guests. If your child doesn't seem too enthused about computer games at the party, don't push it. After all, its his, or her, birthday.

I hope that the programs and suggestions will make the party a success, both for the parents and the children. In any event, my best wishes for the party person: Happy Birthday.

108 80-U.S. Journal

How to Buy or Sell Computer Equipment and Software







Begin your search in the

Start or add to your computer system by finding money saving bargains in each month's issue from individuals who no longer need their personal equipment





You've got your computer hardware, but what about the software? Use a Computer Shopper ad to find what you need. Someone advertising in Computer Shopper probably has what you want.





If you need help with any computer related problem whether it's an interface problem or advice on the right peripheral for a homebrew system, use the free HELP column especially designed for that purpose





As you outgrow your system or want to trade up (most dealers won't take trade-ins), use Computer Shopper ads to sell your items to 20,000 readers nationwide for the low cost of 12 cents per word.



Computer Shopper is THE nationwide magazine for buying, selling and trading Micro and Mini-computer equipment and software. Each issue has over 60 pages full of bargains of new and used equipment.

You can save hundreds of dollars by getting the equipment you need from the hundreds of classified ads individuals place in Computer Shopper every month.

Now is the time for you to join over 20,000 other computer users who save time and money with a subscription to Computer Shopper.

Subscribe today and get your first issue and a classified ad absolutely FREE. Type or print your ad on a plain piece of paper and send it along with your subscription.

Just fill in the coupon or MasterCard or VISA holders can phone **TOLL FREE 1-800-327-9920** and start making your computer dollar go further today.

Cut out and mail to: COMPUTER SHOPPER

P.O. Box F115 • Titusville, FL 32780

Yes, I'll try Computer Shopper, I understand that if I'm not satisfied with my first issue I can receive a full refund and keep the first issue free

- ☐ 1 year \$10.00 (\$30.00 in Canada)
- ☐ I have enclosed my free classified ad
- ☐ I want to use my free ad later, send me a coupon.

NAME: ____

ADDRESS: _

CITY: ___

___ ZIP



Ed. note: Model II owners are not to attempt the OUT procedure that is remarked in Listing 1. Model I/III owners may use the audio feature by changing line 1110 to:

1110 FOR T = 1 TO 50: PRINT#-1,A: OUT255,4: NEXT: CLS: OUT255,4: RETURN

You can change the amount of time the recorder remains on by changing T to be higher or lower than 50. Experimentation is encouraged.

Program Listing 1

- 1 'LISTING 1 FOR FORFEITS GAME
- 5 CLS: RANDOM: GOSUB1000
- 10 PRINT"HI GANG. i'LL HELP YOU DECIDE WHO IS GOING TO DO WHAT FORFEIT."
- 15 PRINT:PRINT"LET'S SEE WHO WILL BE FI RST":PRINT
- 20 INPUT"ENTER THE NUMBER OF PEOPLE PLA YING": N:DIMP\$(N)
- 25 FOR I=1TON:INPUT"ENTER NAME OF PLAY
- ER "; P\$(I): NEXTI
- 3Ø GOSUB2ØØ
- 35 PRINT"YOUR FORFEIT IS ":GOSUB500:P
- 40 Y=RND(10):ON Y GOTO 100,110,120,130, 140,150,160,170,180,190
- 50 PRINT0832, "WHEN YOU ARE READY FOR ME TO CHOOSE THE NEXT PERSON, PRESS ANY KEY"
- 55 KY\$=INKEY\$:IFKY\$="" GOTO 55 ELSE CLS :GOTO30
- 100 PRINT"YOU MUST IMITATE A MONKEY WIT H FLEAS":GOSUB500:GOTO50
- 110 PRINT"YOU MUST KISS EVERY PERSON OF THE OPPOSITE SEX":GOSUB500:GOTO50
- 111 ' YOU MUST ENTER FORFEI'IS FOR LINES 120,130,... 190 USING THE FORMAT IN LI
- NES 100 AND 110
- 200 X=RND(N):CLS
- 205 IFP\$(X)=" "GOTO200
- 210 PRINT@256, "OK "; P\$(X); " IT'S YOUR TURN . . . "
- 215 P\$(X)=" ": RETURN
- 500 FORT=1TO8000:NEXT:RETURN
- 1000 PRINTCHR\$(23):PRINT"* * * ARE YOU READY FOR * * *":PRINT:PRINT
- 1005 PRINT:PRINT"! | | FORFEITS
- 1 1 1"
- 1110 FOR T = 1TO1000:NEXT:CLS:RETURN
- 1111 ' YOU CAN ADD SOUND FROM YOUR TAPE RECORDER IF YOU DESIRE BY USING 'OUT 2
- 55,1' AND OUT 255,0 AROUND LINE 1110 AN D INCREASING THE TIME DELAY TO FIT YOUR
- MUSIC'S LENGTH
 110 80-U.S. Journal

Program Listing 2

- 3 ' LISTING 2 TREASURE HUNT GAME 5 CLS:CLEARIØØ
- 10 PRINTCHR\$(23):PRINTTAB(8)"IT'S TIME FOR":PRINT
- 11 PRINTTAB(15)"A":PRINT
- 12 PRINTTAB(8) "TREASURE HUNT"
- 13 FORT=1TO2000:NEXT:CLS
- 15 PRINT"IN A MINUTE I WILL GIVE YOU TH E FIRST CLUE TO START THE TREASURE HUNT ":PRINT
- 16 PRINT"WHEN YOU FIGURE OUT THE FIRST CLUE GO TO THAT PLACE AND YOU WILL FIND SECRET-WORD #1.": PRINT
- 17 PRINT"LEAVE THE SECRET WORD THERE AN D COME BACK TO ME.":PRINT
- 18 PRINT"I WILL TELL YOU TO ENTER THE S ECRET WORD TO FIND THE NEXT CLUE.":PRINT
- 19 PRINT"THE TEAM THAT FINDS ALL THE SE CRET WORDS FIRST, WINS THE PRIZE.":PRINT
- 20 PRINT"WHEN YOU ALL UNDERSTAND THE RULES OF THE HUNT, PRESS ANY KEY."
- 25 KY\$=INKEY\$:IFKY\$="" GOTO 25 ELSE 30
- 30 CLS:PRINT"CLUE #1 A PLACE WHERE FO OD IS KEPT"
- 31 ' MAKE THIS CLUE GENERAL ENOUGH SO T HAT THE TEAMS HAVE SEVERAL DIFFERENT PL ACES THAT MIGHT FIT THE CLUE
- 32 GOSUB5ØØ: GOTO95
- 35 CLS:PRINT"HERE IS CLUE #2 -"
- 36 GOSUB5ØØ:GOTO95
- 40 CLS:PRINT"HERE IS CLUE #3 "
- 90 CLS:PRINT"HERE IS CLUE #9 -"
- 92 GOSUB500:GOTO95
- 95 GOTO1000
- 100 CLS: INPUT"TYPE IN AND ENTER SECRET WORD #1":W1\$
- 105 IF W1\$="BREADBOX" GOTO 115 ELSE 110 110 PRINT:PRINT"SORRY, THAT'S THE WRONG SECRET WORD":GOSUB500:GOTO30
- 115 PRINT:PRINT"YOU'RE ON YOUR WAY. HER E IS CLUE #2":GOSUB500:GOTO35
- 200 CLS:INPUT"TYPE IN AND ENTER SECRET WORD #2:W2\$
- 205 IF W2\$ = "WHATEVER" GOTO215 ELSE 21 α
- 210 PRINT:PRINT"SORRY THAT'S THE WRONG SECRET WORD":GOSUB500:GOTO35
- 215 PRINT:PRINT"YOU'RE GETTING HOT. HER E IS CLUE #3":GOSUB500:GOTO40
- 500 FORT=1TO2500:NEXT:RETURN
- 1000 CLS: INPUT"WHICH NUMBER SECRET WORD DO YOU WISH TO ENTER"; N
- 1005 ON N GOTO 100,200,300

THE PROGRAMMER'S GUILD PRESENTS PAO NO NO THE

CHARLES FORSYTHE
THE ULTIMATE "PAC-ACTION
ONLY 1995 UPTO 4 PLAYERS!!

Unlike any other PAC game you've ever seen!!

Hot Machine Language Multi-Color

Hi-Res Graphics For All 16K TRS 80

Color Computers

MORE SOUND - MORE ACTION-MORE FEATURES THAN ANY "PAC" GAME IN EXISTENCE!

Try "PAC-DROIDS" for the Outer Limit in pure, explosive arcade action!!

SEND \$19.95 CHECK / MONEY ORDER OR VISA/MC #

THE PROGRAMMER'S GUILD PO BOX 66 PETERBOROUGH NH 03458 OR CALL 603-924-6065 FOR COD

AND GET "FREE" SHIPPING ANYWHERE ON THE PLANET EARTH OR HER COLONIES 1006 ' YOU WOULD NEED AN ADDITIONAL 'GO TO' LINE FOR EACH SECRET WORD

Program Listing 3

- 3 LISTING 3 PROGRAM FOR PICKING TEA MS
- 5 CLS:CLEAR100
- 7 PRINT"I'M GOING TO HELP YOU CHOOSE TH
- E TEAMS FOR THE NEXT GAME":PRINT
- 8 PRINT"PRESS ANY KEY WHEN YOU WANT ME TO START"
- 9 KY\$=INKEY\$:IFKY\$="" GOTO 9 ELSE CLS:G OTO1Ø
- 10 INPUT"HOW MANY PEOPLE ARE PLAYING"; P :DIM P\$(P)
- 11 INPUT"HOW MANY TEAMS DO YOU WANT"; T: M=P/T
- 15 CLS:PRINT"ENTER PLAYERS NAMES, ONE A T A TIME"
- 20 FORI=1TOP:INPUT"; P\$(I):NEXT
- 25 CLS:FORK=lTOT:PRINT"OK, TEAM # ";K;" WILL BE:"
- 3Ø FORJ=1TOM
- 31 X=RND(P)
- 32 IFP\$(X)=" " GOTO31

- 35 PRINTP\$(X);"-";:P\$(X)=" "
- 45 NEXTU: PRINT
- 5Ø FORT=1TO5ØØ:NEXT T
- 55 NEXTK

Program Listing 4

- 1 'LISTING 4 A PROGRAM TO DECIDE WHO GO ES FIRST
- 5 CLS:PRINT"HI GANG, I'LL HELP YOU DECI DE WHO WILL WORK WITH ME FIRST"
- 10 PRINT: INPUT"WHAT IS THE SIZE OF THE GROUP"; N: DIM C\$(N)
- 15 FOR I=1TON:INPUT"ENTER THE NAMES OF THE PEOPLE, ONE AT A TIME"; C\$(I):NEXTI
- $2\emptyset X=RND(N):I=X$
- 25 CLS:PRINT@256, "AND THE WINNER IS .. .";
- 28 IFC\$(I)=" " GOTO2Ø
- $3\emptyset$ FOR T=1TO1 $\emptyset\emptyset\emptyset$:NEXT:PRINTC\$(I):C\$(I)=
- 35 FOR T=1TO1000:NEXT:CLS:GOTO40
- 40 PRINT"WHEN YOU WANT ME TO TELL YOU W
- HO WILL BE NEXT, PRESS ANY KEY"
- 45 KY\$=INKEY\$:IFKY\$="" GOTO45 ELSE 2Ø ■

BACK ISSUES

May/Jun 1979

String packing techniques Determine functions of the brain How to win Nim-type games

Jul/Aug 1979

Create fast graphics Renew lost programs No-hardware lowercase mod.

Nov/Dec 1979

Function grapher/root finder Home heat loss program Restoring killed disk files

May/Jun 1980

Telecommunications with the TRS-80 BASIC game program technique Produce sound with BASIC programs

Nov/Dec 1980

Simple payroll program Digital plotter interface Produce keyboard typeahead

May/Jun 1981

Line packing techniques How to use "PRINT USING" Animation and the TRS-80

Jul/Aug 1981

Descending lower case for Model I Student timetable program Easy tape loading for Model I

Sep/Oct 1981

Keyword search database program

Compute a retail installment contract The vertical mill: a 3 D plotter?

Nov/Dec 1981

Comparison shopper program Real time clock construction Pocket Computer biorhythms program

Jan 1982

Microcomputers in business

Feb 1982

Micros and word processing

Microcomputers and medicine merge

May 1982

Space: An infinite frontier

Jun 1982

Games issue

Jul 1982

The TRS-80 in law offices

Aug 1982 Microcomputers in education

Sep 1982

Graphing and graphics

Oct 1982 Microcomputing tips and tricks

Nov 1982

Telecommunicate with your computer

☐ May/Jun 1979 ☐ Jul/Aug 1979 ☐ Nov/Dec 1979 ☐ May/Jun 1980 ☐ Nov/Dec 1980 ☐ May/Jun 1981 ☐ Jul/Aug 1981	☐ Sep/Oct 1981 ☐ Nov/Dec 1981 ☐ Jan 1982 ☐ Feb 1982 ☐ Mar 1982 ☐ Apr 1982 ☐ May 1982	□ Jun 1982 □ Jul 1982 □ Aug 198: □ Sep 1982 □ Oct 1982 □ Nov 198
Name		
		Zip
•		

MICRO MOONLIGHTER NEWSLETTER

The ONLY publication devoted exclusively to helping you create, build, and maintain a home-based business using your micro-system. SUBSCRIBE NOW to what may be the most important publication in YOUR FUTURE!

1 Year (12 issues) only \$25 U.S., \$29 Canada, \$35 World Wide

J. Norman Goode, Publisher Micro Moonlighter Newsletter

2115-J Bernard Avenue Nashville, TN 37212

Visa and Mastercard welcome. Send account number and expiration date.

77

VIZ.A.CON

A CONSOLIDATION SYSTEM for VISICALC users

New product adds 3-dimensional capability to any VISICALC model

Now with the help of VIZ A CON you can combine multiple "pages" of data from a model for heirarchical consolidations (eg. Dept., Div., Co.) or for summations over periods of time (eg. Week, Month, Quarter, Year-to-date).

Typical uses are to combine weekly sales reports or departmental budget data. You can create a complete network of consolidation processes and modify it any

time (eg. for Merger & Acquisition analysis)
Special formulas (eg. rations, percentages) can be
recalculaded after any consolidation VISICALC
precision is maintained for all data. You can customize titles, row and column headings, footnotes, etc. for

VIZ A.CON creates data files usable with VISICALC After VISICALC "what if" games, use VIZ.A.CON to find out what happened

Model I/III \$89.95 Model II \$119.95 TOLL FREE 24-HR SERVICE 800-547-5995 (Ext 170)

Visa/Master Card

Piu iniii

Or mail Check to A B A C U S ASSOCIATES Suite #240 Dent 101

6565 W. Loop South, Bellaire, TX 77401

"Creating Simple Solutions to Complex Problems"

New Arcade Games For Color Computer

Two exciting arcade-style games from Disk 'n Data:

TUNNEL MAKER — Dig your way to freedom while pitting your skills against those of the evil tunnel monsters. Use your laser to zap falling boulders — but watch out for shriggers! \$11.95

WUMPUS — Destroy the dreaded Wumpus, lurking in the maze of caves. Tight passageways abound, but your arrows will help ward off evil. Keep an eye out for bottomless pits! \$14.95

Both games require 16K Ext. BASIC and joysticks. Please add \$2 for shipping. Order direct from:

DISK 'N DATA MasierCord

5450 Rugby Street Burnaby, B.C., Canada V5E 2N1 PRESSURE-SENSITIVE

LABELS

FOR ALL PRINTERS INCLUDING

9"

CENTER-TO-CENTER **FIXED-PIN PRINTERS**

CALL OR WRITE FOR FREE CATALOG.

(IF YOU HAVE A FIXED-PIN PRINTER, PLEASE LET US KNOW)

COMPUTER LABEL CO. 10619 BURBANK BLVD. NO. HOLLYWOOD, CA 91601 (213) 762-2090

PHONE OR MAIL ORDERS ONLY. NO SALES AT OFFICE ADDRESS.

78



- SIMPLE Installation (all you need is a screwdriver, no soldering)
- Tractor feed remains undisturbed.
- Only \$3995

SATISFACTION GUARANT LED OR YOUR MEINE HALE

MIC RO-GRIP Ltg VISA & Master Card Accept 1 North AFB CA 92-1

(714) 864-6643 Širovovovovovovovovovovovo

MAGAZINE SAMPLES **FREE listing** of over 150 magazines offering a sample copy - 50¢ per sample. Send stamped self-addressed #10 envelope to:

PUBLISHERS EXCHANGE

P.O. Box 220, Dept. 278A Dunellen, NJ 08812

Eight good reasons for using a Mod III:

- 1. Minihiz (1m) General Ledger Accounting System
- Accounts Receivable
- 3. Accounts Payable
- 4. Full-Service Payroll
- 5. Order Entry & Invoicing with Inventory Interface with Accts. Rec. Interface
- 6. Fixed Assets Accounting
- Job Cost Accounting
- 8. Cost Estimating Systems for Manufacturing -for Food Service

At selected Dealers or from the publisher

Nepenthe Programs 44 Third Ave., Ste. F Chula Vista, CA 92010

714-425-5501

The Model III ROM has a built-in screen print routine which replaces graphics with periods. With EPRINT and an MX-80, MX-80 FT, or MX-100 you can dump the screen, including Block Graphics! (Except for new Graftrax-Plus) Also EPRINT allows direct control of all print modes from the keyboard. Automatic relocating Z80 code works with 16-4BK, disk or cassette. EPRINT will also work on newer Model I's .

EPRINT \$17.95

COMMERCIAL 810 RHYTHMS

This program prints a full year Biorhythm chart on any printer. Documentation includes examples of ways to sell these charts. Let your computer help pay for its self. Whether for fun or profit, this is the ultimate Biorhythm program For Model I or III, Lvt II. On cassette

COMMERCIAL BIORHYTHMS \$14.95

California residents add 6.5% sales tax.

RAY KLOTZ & ASSOC. P.O. Box 85513 Los Angeles CA 90072 (213) 918-0275

81

TRS-80 Color Computer

STARS Educational & entertaining. Constellations, planets, etc. \$14.95 DATAFILE Multi-purpose data stor-

age system. Best on the market. Free file included. Specify 16K or 32K. \$19.95 SPIDER ATTACK Shoot-em action!

Extended basic with ML sub-routines. MILLBORNPopular French card

game. Can you drive 700 miles and beat CoCo? \$14.95

COLORSHOW Music, color & your computer. Turn on the stereo and watch the show, \$14.95

DISKPRO No more crashed disks. Creates back-ups of your disk directory and allocation tables. On disk for \$29.95

All programs for Extended Basic TRS-80 Color Computer on cassette tapes or disks, \$5.00 extra ● Add \$1.00 postage.

ILUME DESIGN

Dept. S 4653 Jeanne Mance St. Montreal, Quebec Canada H2V 4J5

Architectural Engineering Library

50 programs in a total of 10 categories including:

Heat Loss. SLR Timber Beams, Steel Beams, Wood Trusses (4 types), Concrete Beams, Walls, Slabs and Footings

TOTAL COST: \$225 (U S)
Individual Categories \$35
Disk, ESF or Cassette

ERIC CLOUGH

Box 52, Winlaw, B.C. Canada VOG 2J0

DHU-GLAS — Box 1664 Sausalito, CA 94966

84

COLOR COMPUTER COLORFORTH

FORTH is a high level computer language like BASIC or PASCAL. COLORFORTH, a version of figFORTH, is available NOW for the TRS-80C computer. COLORFORTH execution time is as much as 10 times faster than BASIC. COLORFORTH requires a minimum of 16K ram, but does not require either extended Basic or disk system. When you purchase COLORFORTH, you receive both cassette and disk versions, the standard figEDITOR, and an extensive instruction manual.

ALL FOR ONLY...........\$49.95



Armadillo Int'l Software
P.O. BOX 7661 PH. (512)459-7325
AUSTIN, TEXAS 78712

87

MODEL I/III SOFTWARE BY:



*** RIPBONDS ***. \$89.95 A COMPUTERIZED PORTFOLIO FOR THE BOND INVESTOR - YTM - CURRENT ACCRUED INT. OUTSTANDING CURRENT/SOLD BOND REPORTS

*** SHUTTLE COMMAND ***.....\$19.95
TRANSPORT YOUR GRP FUEL CELLS THROUGH
BI-DIRECTIONAL METEOR SHOWER - MACHINE
LANGUAGE ARCADE TYPE GAME - AUTOMATIC
HIGH SCORE SAVE - ONLY ORDER IF YOU'RE
READY FOR "THE ULTIMATE CHALLENGE".

- - SEND CHECK OR MONEY ORDER - -

GLENN/CLIFF ASSOCIATES

8301 EAST MONTEBELLO SCOTTSDALE, ARIZONA 85253

90

Dental Computer Newsletter

E. J. Neiburger, D.D.S., Editor 1000 North Avenue Waukegan, IL 60085

The D.C.N. is an international group of dentists, physicians and office management people who have interests in office computers. Though the emphasis is on microcomputers, many members use minis. We cater to all makes and brand names.

Annual membership dues \$15.00. Membership runs from January to January. If you join mid-year, we will supply you with the year's back issues.

85



88

Easy File: Database, Mail List, ect Easy File: Disk, 32K Min, Model I/III S15.00 Stock Quest: 39-week Data File. S11.00 Household Inventory: Database Program Zaars Citadel: RND Situation Game Miners: Hammurabi Type Game S4.00 Stock Game: Easy Type Stock Market Game S5.00 DATA MANIA, INC.

51625 Chestnut Road Granger, IN 46530

Add \$2 00 P/H

16K or 32K, Specify
For 16K TRS-80st Color and Model I/III Tape Only
Specify

TRS-80 MODEL IT.M.* GOLDPLUG - 80

Eliminate disk re-boots and data loss due to poor contact problems at card edge connectors. The GOLD PLUG - 80 solders to the board card edge. Use your existing cables. CPU/keyboard to expansion interface \$18.95 Expansion interface to disk, prin-

VISA

(specify)

ter, RS232, screen printer



.\$9.95 ea

EAP COMPANY
P.O. Box 14, Keller, TX 76248
(817) 498-4242
*TRS-80 is a trademark of
Tandy Corp.

Full set, six connectors. . . \$54.95

86

For Educators, Program Developers, and Hobbyists Presenting mainframe-like JCL control on a Micro!

"BABY BLUE 80*" and "SUPER BLUE 80*"

The BASCOM or RSCOBOL COMPILERS BATCH COMPILER CONTROL DISKS

Two versions for LDOS owners with Radio Shack's COBOL or Microsoft's BASIC COMPILER

"BABY BLUE 80*"

Automatic Job Control Language COMPILER — 9-item compile menu Batch compile 10 source code programs automatically! FORMAT and BACKUP automatically Lucid documentation

"SUPER BLUE 80*"

All BABY BLUE hands off compilation features plus User in compile mode selects custom compilers In batch mode compile up to 10 files from the auto-directory Support features include JOB LOG, ROUTE, or LINK, PRINTER. SPOOLER & SYSTEM TRS-80 MODEL I/III 35 track single density data disk Model III owners use CONVER Special introductory prices BABY BLUE" only \$45 for each version. both \$80 SUPERBLUE 80 for each version \$100, or together \$160 (NY res add 8% sales tax)

Comnet Software Associates

982 Write to: Steve Abramowitz 175 Adams St., Brooklyn Heighls, NY 11201

89

IEEE-488 TO TRS-80* INTERFACE Everything needed to add powerful BASIC GPIB-488 controller capability to TRS-80 Model 1 or 3, Level 2 or DOS with a minimum of 16K.

488-80B For Model 1 Operation









488-80C For Model 3 Operation

Model 488-80B or 488-80C Price: \$375. + shipping, insurance & tax WHEN ORDERING SPECIFY DISK OR TAPE

SCIENTIFIC ENGINEERING LABORATORIES

11 Neil Drive • Old Bethpage, NY 11804 Telephone: (516) 694-3370

*Trademark of Tandy Corp. There is no affiliation between Scientific Engineering Laboratories and Tandy Corp. or Radio Shack.

TRS-80 MODEL 16 AND **68000 SYSTEMS**

DATABASE AND FILE SOFTWARE

Relational Database System Easy To Use - Powerful

INTRODUCTORY OFFER \$595

Menus & English Subset Query Language 68000 Code Efficiency

Separate File & Sort Packages

Features Never Seen Before.

Send For Catalog.

DATA MANAGEMENT SYSTEMS 211 N. EL CAMINO REAL, 101C **ENCINITAS, CA 92024** or Phone: (714) 942-0744

TRS-80 is a trademark of Tandy Corp

93

COCO SOFTWARE

COCO MAIL LIST:

Up to 600 names per disk. ML sorts of any field. Plus many more features!

COLOR LEDGER:

A double entry general ledger, which will easily meet the needs of any small business. COLOR CALC:

Now CoCo can assist you in spreadsheet preparation. All of the above require: 32K RAM, Disk, and a Printer PRICES:

\$50.00 each, any 2 for \$85.00, or all 3 for only \$105.00 ORDER FROM: MDFS Inc.

S.R. 79, Box 103 Orland, ME 04472

96



Toucan Presents:

A new generation of adventures --with graphics!!!

Subterranean Encounter - A fantastic medievai adventure which will take you from above ground with it's castles, wizards, moats, and alligators to the subterranean depths whose evil and danger knows no bounds. A new plateau in adventuring — from Toucan Software, who else?? (TRS-80* Model I or III (Please specify), 32K, 1 Disk Drive). Just \$29.95 at fine software stores everywhere or directly from us.

> **TOUCAN SOFTWARE** 4024 Canonero Court Fair Oaks, CA 95628 (916) 966-4241

*TRS-80 is a registered trademark of Radio Shack, a division of Tandy Corporation.

98

SMITH-CORONA TP-1 DAISY WHEEL PRINTER



Parallel Centronics

· Ask about our discount catalog

MICRO TECHNOLOGY

7817 Ivanhae Ave , San Diego, CA 92037

(714) 457-2149

94

PROFILE USERS

PROAID Gives Dramatic Time Savings!!

- add records in sequence without sarting
- * remove deleted recards without sarting
- display, edit and delete recards randamly
- no need to reformat existing files

PROGRAM & DOCUMENTATION \$50

30 Day Guarantee

1 Year Maintenance

Write: Clay Watts 68C N. Loop Cedar Hill, TX 75104

PROFILE IS A TRADEMARK OF TANDY CORE

97

DISKETTES **CASSETTES**

Error-Free 51/4-inch Diskettes (MD-5) single-sided, soft sector, single or double density, reinforced hub.

Item	Qty 10	Qty 50	
MD-5	\$25.00	\$110.00	
C-10	\$ 7.50	\$ 32.50	
C-20	9.00	39.00	
C-60	11.50	50.00	
C-90	15.00	70.00	

UPS SHIPPING INCLUDED in Continental USA CA Customers add taxes

MICROSETTE

475 Ellis St., Mt. View, CA 94043 (415) 968-1604 Save Grief & Aggravation

-Know Before You Buy-READ

"Consumer Protection for the Microcomputer Owner" COVERS:

- Preliminary Considerations before Buying Legal Differences between Mail Order and Local Store
- Pitfalls and Protection of Paying by Cash,
- Check, Credit Card, etc. What a Warranty Really Is How to Complain Effectively
- How to Legally Reject and Revoke Acceptance of Goods
- 7. Miscellaneous Hints and Suggestions

ONLY \$15 Post Paid (COD \$3 Extra)

Send Check or Money Order to

L. J. KUTTEN, ATTORNEY 201 South Central P.O. Box 16185

St. Louis (Clayton), MO 63105

314-721-6644
Mo. Residents add 4.625% sales tax
Compuserve ID #70655,376 Source ID# TCK092

Most Disk-Directories show only the filespecs plus some hard-tounderstand superfluous information. Our

DISK-MENU & DIRECTORY

DISPLAYS DETAILED DESCRIPTION OF EACH PROGRAM ON A DISKETTE.

filespec and date of creation. **SELECT & RUN PROGRAMS** INSTANTLY.

(For Model I/III, all systems)

 $^{\$}29^{95}+1^{50}$ shipping & handling

TAPE-TRONICS

346 NO. WESTERN AVE. LOS ANGELES, CALIF. 90004



BARCLAY WHYTE
ASSOCIATES.
THE BEAR WITH THE SOFTWARE. TH
WOO-DEPOOL I/III.
VER 2.0-BASIC-MACHINE LANGUAGE

VER 2.0-BASIC+MACHINE LANGUAGE
WORD PROCESSOR.

MAILING LIST.
VER 2.1 - DISK BASIC.
FILESTRUCTURE REQUIRES
NEWDOS VERSION 2.0-SPECIFY MAIL
VERS 2.0 IF DOS NOT AVAILABLE
PRETTY LLIST.
FORMATS BASIC PROGRAM LISTINGS
DOCUMENTATION INCLUDES COMPLETE
PROGRAM LISTINGS
46K MOD I/III DISK-EASILY
MODIFIED TO RUN IN 32KILOBYTES
\$14.95 EACH. DUCUMENTATION ONLY

\$14.95 EACH. WITH DISK.
\$10.95 EACH. DOCUMENTATION ONLY
BARCLAY WHYTE ASSOCIATES DEPT D
\$49 WEST COLUMBIA STREET.
P.O. BOX 948, NeW MESTMINSTER.
B.C. CANADA. V3L 5C3.
ADD \$1.00 FOR POSTAGE ADBOUS3
B.C. RESIDENTS ADD TAX AT 5%.
TRS-80 TM OF TANDY CORPORATION.
NEWDOS TM OF APPARAT INC.

TRS-80 MODEL I/III **PROGRAMS**

for Cassette and Disc

EDUCATIONAL BUSINESS HOME MANAGER UTILITIES

INQUIRIES WELCOMED

J/C ENTERPRISES BOX 441186 MIAMI, FL 33144

'trademark Tandy Corp.

101

CANADIANS A-K SOFTWARE DISCOUNT PRICES

STAR WARRIOR: 2 scenarios; 5 levels of skill; 19 command options; 6 different sounds. Emphasis is on fast action and

Cassette level 11, 16K or Disk TRSDOS 32K. Guaranteed by A-K and Automated Simula-

\$44 Canadian plus \$1.50 postage and handling, B.C. Residents add 6% sales tax.

A-K SOFTWARE

480 Balsam Ave., Penticton, B.C. V2A 6J7

☐ Cassette ☐ Disk

Payment enclosed or charge my U VISA M.C.

Name (PRINT) _

Address _____ Prov. ____ PC_

City .

Acct. # _ ____ Exp. Date _

Signature

* TRSDOS -- Trademark of Tondy Corp

104

Pascal-80 Phelps Gates

This friendly, easy to use version of Stondord Poscol, as reviewed in the December 1981 Byte, is now even better! New version works on TRS-80 Model I and Model III, under New version works on I KS-80 Model I and Model III, under TRS-DOS, NewDOS & DOSPlus, LDOS, and DoubleDOS. An author package allows you to create your own /CMD files without any royalty payments! Upper and lower case is fully supported. You can protect memory and call machine language programs. New extensions include SET, RESET, POINT, RND, and the UCSD Include procedure. Utilities are provided to convert to and from ASCII files. Pascal 80 now comes in a binder with an 80 page manual by

With monitor, editor, and compiler in memory at the same time, no other Pascal is easier to learn! One college found that it could teach half again as many students on the same number of computers after switching from UCSD Pascal to

rassai 50
Full 14 digit accuracy on all math functions, including log and trig functions, makes this a serious Pascal. Disk file handling is supported, with a mail list program included as a demonstration.

Upgrades are available for those who bought Ramware Pascal 80. Call or write for information.

Send \$101 (includes shipping) to: New Classic Software

239 Fox Hill Road, B Denville, NJ 07834

Credit card orders: (201) 625-8838

(PASCAL-80 does not implement variant records, pointer and window variables, or functions and procedures used as parameters.)

WHO NEEDS DISKS

FOR RELIABLE, HIGH QUALITY WORD PROCESSING?

MOST HOME USERS DON'T!

For long texts or short what you need is TXMODE

TXMODE is a new, sophisticated machine language program that extends ROM edit capability to text material and adjusts line lengths for any desired output format. No limit on manuscript size-has been used to revise a 300-page novel. Commands added to BASIC direct mode, plus many prompts, make proofreading, tape operations and page formatting easy. Works with any printer; special options with Epson MXBO.

Models I and III, 16K up \$29.95 + \$2 P&H. FREE BROCHURE.

TOPS Programming Enterprises
QUALITY TAPE OPERATING SYSTEMS AND COMPATIBLE SOFTWARE FOR HOME USE 8990 S.W. Camille Terrace Portland, Oregon 97223

102

– Professional –

Tax Expense Report Prints Checks

Prints Receipts

REAL ESTATE SOFTWARE for APPLE, TRS-80 & CPM SYSTEMS

PROPERTY MANAGEMENT SYSTEM: \$450
 Tenant History Deperating Stml
 Lale-Rent Report Building Reports
 Vacancy Report Utilities Report

Income Report Auto Late Charge Returned Checks

PROPERTY LISTINGS/COMPARABLES: \$325

— SCREEN BY — Max/Min Price
22 Items/Listing Max Price/Income
1000 Listing/Oisk Max Price/Sq Foot
Listing Memo Field Min Cashilow

REAL ESTATE ANALYSIS MODULES: \$50/Module Home Purchase Income Prop Analysis Property Sales Construction Cost/Profit Loan Sales/Purchase

Tax Oeferred Exchange APR Loan Analysis Loan Amortization Depreciation/ACRS Analysis Loan Wrap Analysis WORD PROCESSOR - WORD STAR: \$295



Suite E. 1116-8th Street, Manhettan Beach, CA 90266

TRS-80 DISK and TAPE USERSIII Protect your investment in disks and tapes! END loading problems. One TOOL does it ALL! Tape Reproduction System Tape or Disk Utility for Model I or III Read TAPE and/or DISK Write TAPE and/or DISK Verify TAPE written will load ANY TRS-80 protocol TAPE Identifies BASIC, SYSTEM, EDTASM Change program name as desired Select tape speed H/L (Mod III) Select tape port 0/1 (Mod II) OFFSET load addresses UNOFFSET load addresses UNOFFSET load addresses if offset Displays operational STATUS plus Diskette directory (0-3) Load Map (start-end addresses) NAME, LENGTH, FORMAT of data START, END, EXECUTE addresses Automatic protocol conversion SINGLE disk drive copy (Mod I) Archives on TAPE for DISK or TAPE Run TAPE programs from DISK 14 Menu-driven features in all! DISK features require TRSDUM

TRSTUM-16K tape systems ONLY \$16 95 TRSDUM-1 drive TRSDOS systems ONLY \$17 95 Specify Model I or III - add \$1 00 postage and handling Send check, money order or SASE to:

CRB Microtools
"Software MJOOIS for the 80's"
14835 N First Avenue
Phoenix, AZ 55023
TRS-80 & TRSDOS - trademarks of Tandy Corp

PROGRAMMING EASE WITH TRS-80 III AND EP-10

The new Model EP-10 can program 2716/2732 eproms also Signetics 82S123 & 82S129 bipolar proms. EP-10 comes with easy to use menu driven software. Connects to existing 50 Pin connector! Software supplied on cassette or 51/4" disk. EP-10 279.95

Shipping, Ins., Handling

5.00

Total

284.95

Riverlake Systems, Inc. P.O. Box 1927 Roswell, Ga. 30077

Send for

404-475-0028

brochure.

103

☆☆ SUPER"☆☆ ISA's DATABASE

The only DBMS with all these features:

- PROVEN in one year of test marketing TOUGH, reliable file structure
- MENU driven for simplicity and easy use
- ARITHMETIC with stored calculations FAST set-up and report formating CLEAR user-oriented documentation
- PRINTS totals & subtotals mail labels
- REFORMATS and merges data files MULTI-DISK files: Up to 128K records
- SORTS full disks on up to 40 fields PRODUCTION input of repetitive data
- COUPLES to word processor & statistics POSTS transactions to master file
- SEARCH by strings, ranges, comparisons DATA COMPRESSION: Over twice as
- many labels as the other system

For TRS-80° Models I. II. & III - 250.00

CDC 13715 Vanowen Street Van Nuys, CA 91405 (213) 873-6621

*T M Tandy Corp

106

EPSON* LOVERS

Save money by reloading your own MX-80* cartridges. Low prices on ribbon inserts. You'll like my service and detailed instruction sheet.

More savings available by using the MARK I or MARK II reinkers. You can reink your own cartridges with less than a dime's worth of special ink.

Join the COLOR bandwagon with my new list of color inks, color and uninked ribbons, plus other goodies.

Save BIG BUCKS by using the less than \$4.00 single sheet feeding device.

All sorts of new ideas in the works. Write today for free information.

PETE SKEBERDIS P.O. Box 27 Fremont, Michigan 49412

*EPSON & MX-80 trademarks of EPSON America, Inc.

*** FAST ***

- * In-Memory Data Base program for Mod I, III, 48K disk
- * Sophisticated 3 Machine-Language Subroutines
- 1. Sort 1 to 5 Major Fields, carry all Minor Fields 2 Instring Search on 1 to 2 Fields with as few as 1
- character up to an entire Field
 3. Instant Deletion of Record No waiting on record move-up.
- * Any number of Fields & up to 255 characters per Field. Limited only by available memory.
- * Easy Print-out Formatting, Great for Data Storage AND Mailing Lists.
 - * Only **\$29.95** + **\$2** P&H On Formatted S.D. 35-Trk. Disk. Check or M.O.

W.H. Sumrall

Rt. 1, Box 142 AB1 Sherman, TX 75090 (214) 532-6565

110

Do you have a few holes in your collection of 80-U.S. Journals?

We might be able to fill them!

Contact:

80-U.S. Back Issues

3838 South Warner Tacoma, WA 98409 (206) 475-2219



111



- +REPORT FLEXIBILITY/CAPACITY +DEPARTMENT P & L (UP TO 5)
- +UNLIMITED ACCOUNT CATEGORIES +STATEMENT OF CHANGES (ASSETS)
- +PERCENT P & L comparison
- 100% sales or net sales or total Exp
- MTD vs YTD OTD VS YTD MTD VS QTD

m

COD 🕜

+WITH TDOS (A MINI DOSPLUS)

149.95

reg 32K 2 drives

test set \$50 00 manual \$30.00

HOLMAN D-P SERVICE 2059 W LINCOLN ACITY

OROVILLE, CA 95965 VISA/MC 3 00 S&H (916) 533-5992

STEMSLTYSYSTEMSLARGEC

NUMBER CRUNCHER

A complete STATISTICAL PACKAGE. Includes a menu-driven database manager with the following: Multiple Regression, Interactive Stepwise Regression, One-way Anova with post hoc comparisons, Two-way Anova with interaction and unequal cell frequencies, Analysis of Covariance, Repeated Measure Anova, Contingency Tables, Cross Tabulation, t-tests, Principle Component (factor) Analysis, Nonparametrics, Probability Distribution Calculator, Correlation Analysis, Histograms, Scatter Plots, Forecasting Programs and Unvariate Statistics

The program includes over 25 variable transformations, including a recording

Send \$99.95 plus \$3 shipping.

Dr. Jerry L. Hintze

865 East 400 North Kaysville, Utah 84037 801-546-0445

112

Get

PREE

Programs for the

Color Computer

Join the

East Texas **Color Computer**

2101 East Main St. Henderson, TX 75652

114



- Unique abstract feature permits positive file identification Catalog includes human readable remarks from machine cade files. Contains ID, name, date, free space, filespec
- Read ony size directory from ony size disk of ony density with any number of tracks and any number of sides
- Machine language sart by ony field Multi-format print in any sarted arder. Single sheet or cantinuous forms. Save to disk option. Very fost machine code. Self-prompting. User friendly. Camplete eosy to understand documentation.

Please Specify MODEL and DOS When Ordering Requires 2 Drives and 48K RAM

Satisfaction Guaranteed - Ten day return privilege

Introductory Price Until January '83 39°5 (plus 2°° shipping and handling)

Check - Visa - Mastercard Dan Fielding • 2207 N W 61st Place • Margate, FL 33063



the LEADER of the pack . . . Write for free catalog with more than 400 fantastic values for all your word and data processing needs. Outside USA, enclose \$1,00 ABM PRODUCTS
8868 CLAIREMONT MESA BLVD.
SAN DIEGO, CALIFORNIA 92123 Toll Free 800-854-1555 Orders Only For information or California Orders (71-1) 253-1517

For Radio Shack Printers

new

Ribbons For:

- Daisywheel II
- Line Printer II, III, V
- and Others

recycle

Your Used Ribbons.

Service available for most printer ribbon types.

Buy directly from a major manufacturer and save! FREE CATALOGUE!

Aspen Ribbons, Inc. 1700 N. 55th St. Boulder, CO 80301 (303) 444-4054 Toll Free 1-800-525-0646

117

p.c.	Automatana Para	101	1	J/C Enterprises116
RSN 104	Advertiser Page A-K Software116	8		J. F. Consulting
43	Aardvark-80	69		Jessup Company, The 100
79	Abacus Associates	60		Jimscot, Inc
116	A8M Products	72		Kensoft 104
14	Access Unlimited	81		Klotz, Ray & Assoc
44	Ace Computer Rentals 78	95		Kutten, L. J., Attorney
66	Ace Computer Prod. of Florida, Inc 99	42		KWIK Software 75
39	Algorix	67		Langley-St. Clair Systems, Inc 99
58	Alpha Products 89	52		Lawyer's Microcomputer, The 82
45	Anitek Software Products 78	12	1	Leading Edge, The 8ack Cover
38	Apparat, Inc 67	42		Lemons Tech Services
87	Armadillo International 114	16		Lindbergh Systems
117	Aspen Ribbons, Inc117	3 5		LNW Research Corp 62
*	Aspen Software Co101	17		Lobo Drives
2 6	8. T. Enterprises 49	1		Logical Systems, IncInside Front Cover
74	BAP\$ Software	11		Logical Systems, Inc
100	Barclay Whyte Associates 115	41		Marymac Industries, Inc
28	8inary Devices	96		MDFS, Inc
119	Business Division, The	47		Micro Architect
	A Div. of Scott Adams, Inc	6,		Micro Labs, Inc
6 3	8usiness Micro Products 97	37		Micro Management Systems 66
19	Chromasette Magazine	77 94		Micro Moonlighter Newsletter 113 Micro Technology
20	CLOAD Magazine, Inc	80		Micro-Grip, Ltd
84	Clough, Eric	2		Micro-Systems Software, Inc
89	Comnet Software Assoc., Inc 114	36		Micro-Systems Software, Inc 65
122	CompuKids	99		Microsette
10 46	Computer House	59		Miller Microcomputer Services 93
7 8	Computer Label Company	21		MISOSYS 41
65	Computer Plus			MISOSYS 56
123	Computer Shopper 109			Nepenthe Programs113
68	Computer Trader		7	New Classic Software
13	Computing Teacher, The		,	Nocona Electronics 51
33	Cornsoft Group, The 59		3	One Stop Software
30	Cornucopia Software, Inc 55			Percom Data Company, Inc 2
5 3	Cosmopolitan Electronics Corp 83	22	2	Perry Oil & Gas, Inc
108	CRB Microtools	31		Pioneer Software 55
106	CDC 116	5		PMC Software 7
50	Data Associates 82			Program Store, The16, 17
93	Data Management Systems 115			Programmer's Guild, The111
91	Data Mania, Inc114		3	Prosoft
8 5	Dental Computer Newsletter114			Publisher's Exchange
82	Disk 'n Data	34		Radio Shack
86	EAP Company		20	Rainbow, The
114				Realty Software Company116
62	Eigen Systems)5 1	REM Industries, Inc
*	80-N.W. Books			REMarkable Software
★ 61	Electronic Specialists, Inc			Rimes Computer Products 102
12	Epson America, Inc			Riverlake Systems, Inc116
88	Excellonix			Scientific Engineering Labs114
115			9	Skeberdis, Pete
56	Fink, William		18	Soft Sector Marketing, Inc119
49	Freedom Micro Systems, Inc		5	Software Magic104
90	Glen/Cliff Associates		10	Sumrall, W. H
*	Gooth Software 47		1	Superior Software, Inc 82
40	Hacks72		5	T & D Software 86
*	Hexagon Systems11, 12, 13			TAPE-TRONICS
112	Hintze, Jerry, Dr	7 24	4	Think Software 47
73	Holman D-P Service104		5	3G Company, Inc
113			02	
64	Holmes Engineering, Inc			Toucan Software
4	UG			Triple D
83	Ilume Design			Watts, Clay, Inc
29	Interpro Corporation			Wiley, John & Sons, Inc
57	J & M Systems, Ltd	3 ★	i	Contact these advertisers directly.

Merry Christmas

This bulletin board space is available free to individuals with single or unusual items for sale or trade, and for other announcements of interest to the general readership of this magazine. 80-U.S. Journal reserves the right to reject any commercial advertising in this section and suggests using our display advertising for that purpose.

These notices are free of charge and will be printed one time only on a space available basis. Notices will be accepted from individuals or bona fide computer user clubs only. All announcements must be typed, contain 75 words or less and include complete name and address.

The LNW USER Group is a group of LNW80 owners with the desire to share their experiences and programs with others. The group publishes a bi-monthly newsletter of hi-res and color programs and hardware hints. Dues are \$12 per year Contact the LNW USER, 4345 Manchester, Grand Island, NE 68801.

Call for papers: A new quarterly, The Journal of Computers Reading & Language Arts (CRLA), is ready to receive papers. The journal supports the rapidly growing interest in computers and their relationship to reading, language arts and related issues. The theme will be pragmatic in perspective. It will emphasize papers which have clear classroom/teaching implications. The journal will be interdisciplinary and directed toward reading-language arts teachers, educational specialists, classroom teachers, and others. Send papers or requests for information to Gerald H. Block, CRLA, P.O. Box 13039, Oakland, CA 94661.

FOR SALE — TRS-80 software on original disk or cassette with original documentation. Astrology, \$15, Eliza, \$8; Profile, \$35; Airaid, \$7; VisiCalc, \$50; Scripsit, \$50. *TRS-80 Disk and Other Mysteries Book*, \$13. Also, 20 issues of *CLOAD* and dozens of *Softside*, 80-U S Journal, etc., for sale or trade Melvin L Mauck, 16 Edmondson Avenue, Lexington, VA 24450. (703) 463-4389.

FOR SALE: Percom Data Separators (2) \$20 each Cashier's Check or postal money order. Construction Engineering, Inc., 125 Irving Street, P.O. Box 2154, Framingham, MA

COLOR COMPUTER DISK INTERFACE for the Exatron "thing." Includes Color Disk 1.0 ROM \$80 plus postage. Earnie Kahn, 8222 Kingsbrook No 560, Houston, TX 77024, (713) 467-9734.

FOR SALE: Radio Shack Line Printer V. Excellent condition Sold for \$1850 new, will sell for \$1500 or best offer 160 cps with 15" platten and adjustable tractor. 7 x 9 matrix with five type styles. Upper/lowercase with true descenders. Bold face and underline Radio Shack's BEST printer for heavy business use. Will consider Epson MX-80 or equivalent for partial payment.

For Sale: Percom (MPI) 40-track, drive 1 for Model III Working perfectly — \$190. R/S Line Printer 2, 100 cps — \$400 or best offer. BASF 40-track refurbs — \$155 bare. New 5½" case and power supply — \$50. Color Computer drive 0 new! — \$400. Steve Kolokowsky, 8 Wilson Court, Spring Valley, NY 10977. (914) 362-0713 after 7 p.m. EST.

HAVE an interesting way to make money with your microcomputer? I'm writing a book on it and would like to hear your suggestions! Please contact Tim Knight, 10 Fieldbrook Place, Moraga, CA 94556, (415) 376-8471.

1s There Nothing Sacred?



Don't Miss This Outstanding Original Arcade Game!



FILL SERVICE OF POR • Garden City, MI 48135

Prices per Game: TRS-80 32K Level II Mod I/Mod III Diskette
TRS-80 32K Level II Mod I/Mod III Diskette F. TRS-80 32K Level II Mod I/Mod III Cassette \$19.95 10% discount for 2 items, 15% for 3 or more. Please add \$2.50 per order Michigan residents add 4% sales tax Inscount for 2 trems, 15% for 5 of more. Please add \$2.50 per order tax:

for Postage & handling, Michigan residents add \$10.00 per order. Please add \$4% sales tax:

Outside USA (except Canada) please add \$10.00 per order. Written by Factory Programming • ©1982 Ostage & handling, whichigan residents and 4% sales tax.

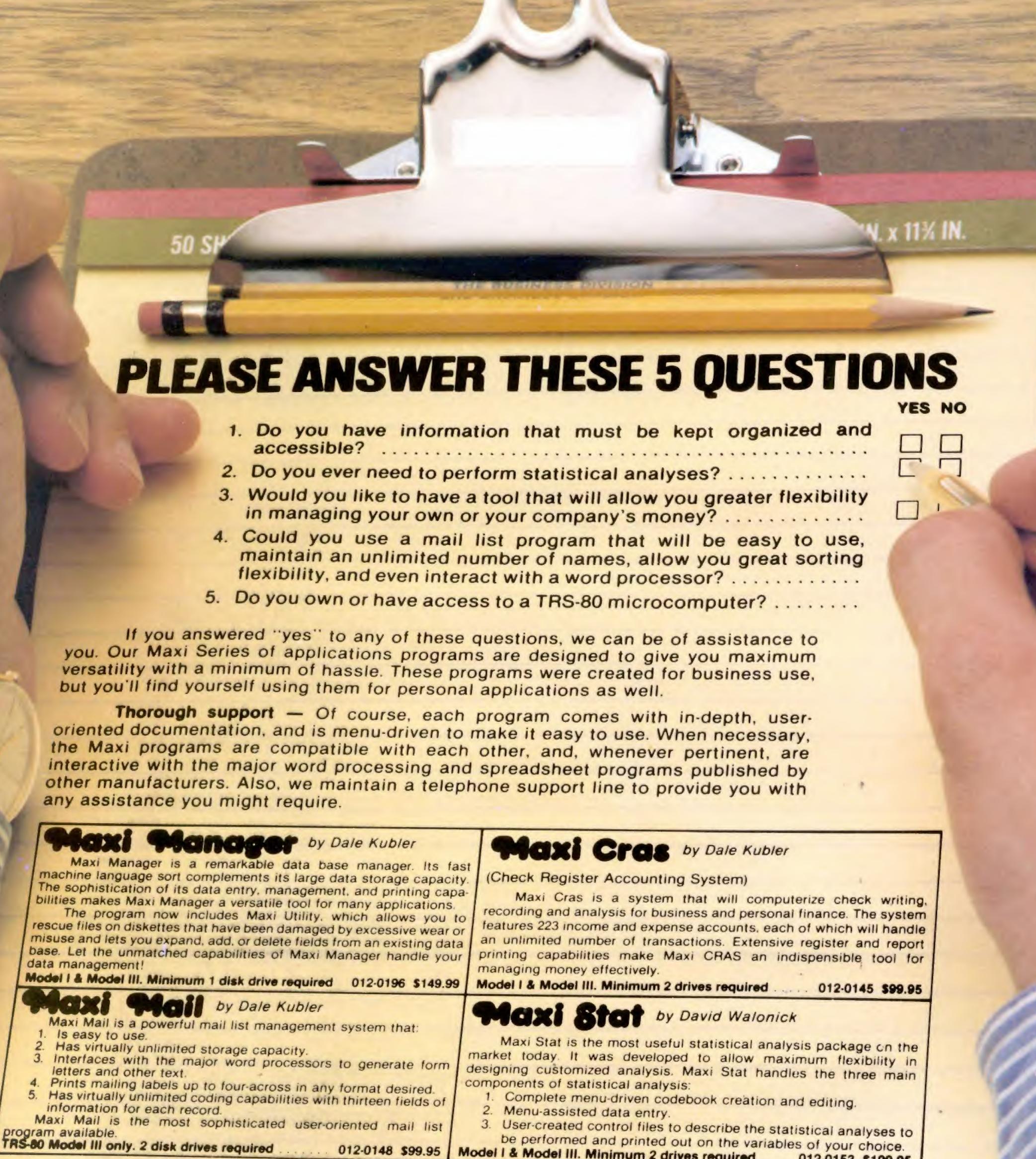
Outside USA (except Canada) please add \$10.00 per

800-521-6504/(313)425-4020 able through the cassette AUX plug. High scores are automatically saved after each game on disk versions.

*Compatible with Trisstick Call or write for our complete catalog.

Mastercord VISA' PARENCESS:

The Quality Continues



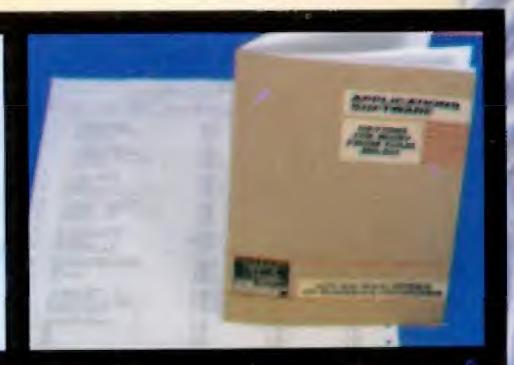
A Division of Scott Adams, Inc. Model I & Model III. Minimum 2 drives required 012-0153 \$199.95

Send \$1.00 for our 16 page booklet "Getting The Most From Your Micro" All 16 pages are packed with indepth explanations and printout samples from the Maxi Series of applications programs.

THE BUSINESS DIVISION

BOX 3435 LONGWOOD,FL 32750 (305) 830-8194

119



Gifts to Please the Man Who Has Everything—Including a TRS-80°



A Program Pak™ File Box. Keep your Color Computer Program Paks or boxed cassettes right at your fingertips. Holds 16. #26-1314, \$34.95

B Screen Cleaner. Includes pre-wet wipes and cleaning cloth. #26-1318, \$6.95

C Anti-Static Spray. Use on carpet, screen, equipment to protect data. #26-515, \$5.95

TRS-80 Color Computer Graphics Tablet. Instant

graphics at the touch of a pen! Use pen for drawing or stylus for tracing—the "X-Pad" reads the design into your Color Computer at 100 points per second. Controller plugs into ROM slot. Accesses Extended BASIC graphics commands. #26-1196, \$349.95



E Anti-Glare Screen. Nylon mesh reduces glare and improves contrast. Protects your eyes from fatigue. Installs easily on Model I, II, III, 16. #26-511, \$16.95



E SW-301 Auto Control Power Strip. Automatically turns on up to 5 peripherals when you power on your Model II, III or 16. Two-stage transient protection. U.L. listed. #26-1429, \$69.95

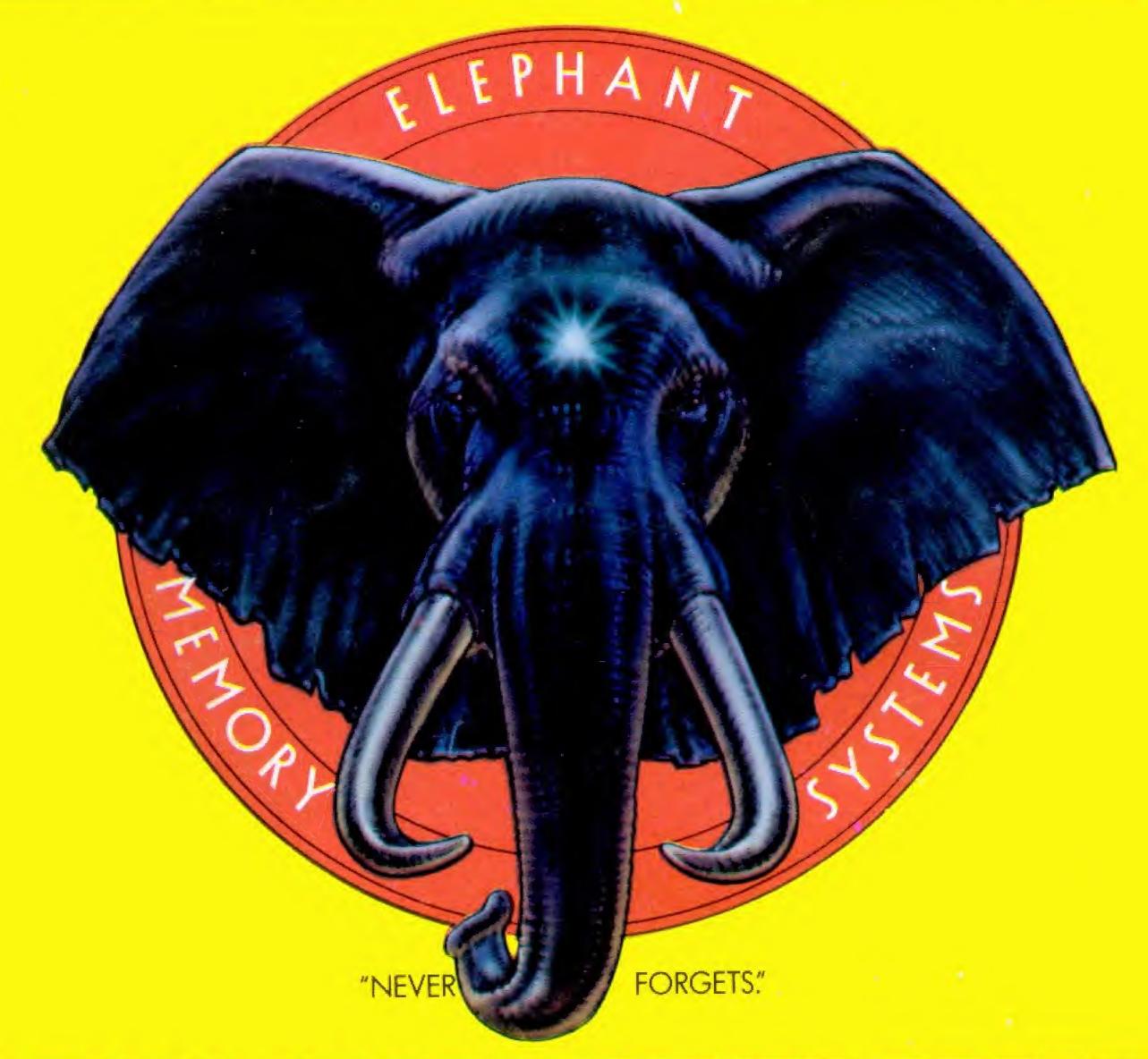
G SW-302 Parallel Printer Switch. Dual parallel ports let you connect two printers to a single computer, or two computers to one printer. U.L. listed AC power module. #26-1498, \$119.95

Complete Your Shopping Today! Choose from many other accessories at the Radio Shack Computer Center, store or participating dealer near you.

Radio Shaek

The biggest name in little computers™

A DIVISION OF TANDY CORPORATION Retail prices may vary at individual stores and dealers.



MORE THAN JUST ANOTHER PRETTY FACE.

Says who? Says ANSI.

Specifically, subcommittee X3B8 of the American National Standards Institute (ANSI) says so. The fact is all Elephant™ floppies meet or exceed the specs required to meet or exceed all their standards.

But just who is "subcommittee X3B8" to issue such pronouncements?

They're a group of people representing a large, well-balanced cross section of disciplines—from academia, government agencies, and the computer industry. People from places like IBM, Hewlett-Packard, 3M, Lawrence Livermore Labs, The U.S. Department of Defense, Honeywell and The Association of Computer Programmers and Analysts. In short, it's a bunch of high-caliber nitpickers whose mission, it seems, in order to make better disks for consumers, is also to

make life miserable for everyone in the disk-making business.

How? By gathering together periodically (often, one suspects, under the full moon) to concoct more and more rules to increase the quality of flexible disks. Their most recent rule book runs over 20 single-spaced pages—listing, and insisting upon—hundreds upon hundreds of standards a disk must meet in order to be blessed by ANSI. (And thereby be taken seriously by people who take disks seriously.)

In fact, if you'd like a copy of this formidable document, for free, just let us know and we'll send you one. Because once you know what it takes to make an Elephant for ANSI . . .

We think you'll want us to make some Elephants for you.

ELEPHANT. HEAVY DUTY DISKS.

For a free poster-size portrait of our powerful pachyderm, please write us.

Distributed Exclusively by Leading Edge Products, Inc., 225 Turnpike Street, Canton, Massachusetts 02021

Call: toll-free 1-800-343-6833; or in Massachusetts call collect (617) 828-8150. Telex 951-624.